IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	:	**Confirmation No. 2875**
Naoki MIDOH et al.	:	Attorney Docket No. 2002_0317A
Serial No.10/070,387	:	Group Art Unit 1652
Filed March 6, 2002	:	Examiner David J. STEADMAN
CYCLIC DEPSIPEPTIDE SYNTHETASE AND METHOD FOR RECOMBINANT PRODUCTION (as amended)		**Mail Stop: Appeal Brief-Patents**

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the final decision of the Examiner set forth in the final Office Action dated October 6, 2005, finally rejecting claims 13 and 15, which are attached herewith in the Claims Appendix. A Notice of Appeal was filed on March 6, 2006. A petition for a two month Extension of time hereby accompanies this Brief.

THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEES FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975

TABLE OF CONTENTS

PAGE

I. REAL PARTY IN INTEREST

The real party in interest is MEIJI SEIKA KAISHA, LTD., assignee of the entire right, title and interest to this application.

II. RELATED APPEALS AND INTERFERENCES

There are no related prior nor pending appeals, interferences, or judicial proceedings known to Appellants, Appellants' legal representatives, or assignee which will affect or be affected by, or have a bearing on the Board's decision in the present appeal.

III. STATUS OF CLAIMS

The status of the claims as indicated in the Advisory Action dated January 27, 2006 is as follows:

Claims pending: 1-13 and 15

Claims withdrawn: 2-12

Claims rejected: 13 and 15

Claims in condition for allowance: 1

Claims appealed: 13 and 15

IV. STATUS OF AMENDMENTS

The last amendment to the claims was in the after final response filed on January 4, 2006. In item 7(b) on page 1 of the Advisory Action dated January 27, 2006, it was indicated that this amendment will be entered for purposes of Appeal.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention of claim 1 relates to a novel cyclic depsipeptide synthetase polypeptide, which is a protein comprising the amino acid sequence of SEQ ID NO: 2. Support can be found at page 3, lines 16-19 of the disclosure. The claimed protein has cyclo(D-lactyl-L-N-methylleucyl-D-3-phenyllactyl-L-N-methylleucyl-D-lactyl-L-N-methylleucyl-D-3-phenyllactyl-L-N-methylleucyl) (PF1022) synthetase activity. See page 1, lines 13-17. The claimed protein has 3210 amino acid residues. See page 15, lines 16-24.

The invention of claim 15 is an isolated protein encoded by a nucleotide sequence selected from the group consisting of: (a) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 2; (b) the nucleotide sequence of SEQ ID NO: 1; (c) a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1 under stringent conditions at 0.2 x SSC concentration (1 x SSC: 15 mM trisodium citrate, 150 mM sodium chloride) in a 0.1 % SDS solution at 60°C for 15 minutes and which encodes a protein having PF1022 synthetase activity; and (d) a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1 and which encodes a protein having PF1022 synthetase activity.

The invention of claim 13 relates to a method for producing the cyclic depsipeptide synthetase protein of SEQ ID NO: 2 having PF1022 synthetase activity. The method comprises: (1) culturing a host cell transformed with a vector containing a nucleotide sequence under conditions suitable for protein expression, wherein the nucleotide sequence is selected from the group consisting of: (a) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 2; (b) the nucleotide sequence of SEQ ID NO: 1; (c) a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1 under stringent conditions at 0.2 x SSC concentration (1 x SSC: 15 mM trisodium citrate, 150 mM sodium chloride) in a 0.1 % SDS solution at 60°C for 15 minutes and which encodes a protein having PF1022 synthetase activity; and (d) a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1

and which encodes a protein having PF1022 synthetase activity; and (2) collecting the protein from the culture medium.

Support for elements (a) and (b) of claims 13 and 15 (*i.e.*, a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 2 and the nucleotide sequence of SEQ ID NO: 1) can be found in the specification, for example, at page 3, lines 27-30.

Support for element (c) of claims 13 and 15 (*i.e.*, a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1) can be found at page 4, lines 2-4 of the disclosure. Support for the specifically recited stringent hybridizations conditions in element (c) of claims 13 and 15 can be found in the specification, for example, at page 6, lines 11-15.

Support for element (d) of claims 13 and 15 (*i.e.*, a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1 and which encodes a protein having PF1022 synthetase activity) can be found in the specification, for example, at page 6, lines 5-10.

Support for the method of culturing the host cell transformed with a vector containing the nucleic acid and expression of the nucleic acid of claim 13 can be found at page 4, lines 12-23, and page 20, line 3 to page 21, line 25.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 13 and 15 were rejected under 35 U.S.C. § 112, first paragraph, on the basis that the specification is only enabling for the polypeptide of SEQ ID NO: 2 and a method for production thereof by culturing a host cell transformed with a vector comprising the nucleic acid of SEQ ID NO: 1 or a nucleic acid encoding SEQ ID NO: 2, and not for polypeptide variants encoded by nucleic acids that hybridize with SEQ ID NO: 1 under stringent conditions or nucleic acids that share at least 95% homology with SEQ ID NO: 1. See item 12 on pages 4-8 of the final Office Action dated October 16, 2005 and item 3 on pages 2-10 of the Advisory Action dated January 27, 2006.

VII. ARGUMENT

Claims 13 and 15 were rejected under 35 U.S.C. § 112, first paragraph, on the basis that the specification is only enabling for the polypeptide of SEQ ID NO: 2 and a method for production thereof by culturing a host cell transformed with a vector comprising the nucleic acid of SEQ ID NO: 1 or a nucleic acid encoding SEQ ID NO: 2, and not for polypeptide variants encoded by nucleic acids that hybridize with SEQ ID NO: 1 under stringent conditions or nucleic acids that share at least 95% homology with SEQ ID NO: 1. See item 12 on pages 4-8 of the final Office Action dated October 16, 2005 and item 3 on pages 2-10 of the Advisory Action dated January 27, 2006. Accordingly, the rejection is based on the premise that elements (c) and (d) of claims 13 and 15 are not enabled.

It is believed that the patentability of the invention is directed to the product of claim 15. In other words, the patentability of the process of claim 13 is based on the patentability of the product of claim 15.

Furthermore, it is respectfully submitted that elements (a), (b), (c) and (d) of claims 13 and 15 are each separately patentable from each other. As noted above, the rejection is based on the premise that elements (c) and (d) of claims 13 and 15 are not enabled. In fact, the Office has indicated that the claims are enabled for elements (a) and (b) of claims 13 and 15. If the rejection is affirmed in part on the basis that it remains applicable to elements (c) and (d), but not (a) and (b), kindly indicate such and provide Appellants an opportunity to amend the claims to that which is indicated as enabled.

On page 3 of the Advisory Action and on page 5 of the Office Action, it was indicated that the disclosure is limited to the single working example of SEQ ID NO: 2 and a method of making this polypeptide having PF1022 activity, because there is no working example of a variant of SEQ ID NO: 1 that encodes a polypeptide having PF1022 synthetase activity.

On pages 5-9 of the Advisory Action and on pages 6-7 of the final Office Action, it was indicated that the hybridization under stringent conditions language in part (c) and the "at least

95% homology" in part (d) of claims 13 and 15 are so broad as to encompass a vast number of nucleotide sequences encoding polypeptide variants having PF1022 synthetase activity.

This rejection is respectfully traversed for the same reasons set forth in the after final response filed January 4, 2006 and the response filed July 11, 2005 and for the following reasons.

The claims are directed to an isolated cyclic depsipeptide synthetase polypeptide having PF1022 activity and a method of making such.

Specifically, element (c) of claims 13 and 15 requires that the polypeptide is encoded by a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1 under stringent conditions at 0.2 x SSC concentration (1 x SSC: 15 mM trisodium citrate, 150 mM sodium chloride) in a 0.1 % SDS solution at 60°C for 15 minutes and which encodes a protein having PF1022 synthetase activity. Accordingly, the claims clearly define the specific stringent conditions required as set forth on page 6, lines 11-16 of the disclosure.

Element (d) of claims 13 and 15 requires that the polypeptide is encoded by a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1 and which encodes a protein having PF1022 synthetase activity.

In both cases, the claims require that the nucleotide sequence encode a functional protein with PF1022 synthetase activity.

As argued in the January 4, 2006 after final response and the July11, 2005 response, it is respectfully submitted that the polypeptides encompassed by claims 13 and 15 do not include the vast number of variant nucleotide sequences encoding polypeptide variants of SEQ ID NO:2 having PF1022 synthetase activity as asserted by the Office in the Advisory and the final Office Action. Moreover, even if the claims encompass a large number of polypeptides, it would not take undue experimentation to make and use the full scope of the claims.

Regarding the "hybridization under stringent conditions" and the "at least 95% homology language", Appellants again respectfully submit that PTO policy has long been to recognize that such language is patentable and enabled.

In this regard, and as discussed in prior responses, please note Examples 9, 10 and 14 of the PTO's Revised Interim Written Description Guidelines Training Materials, which were drafted and used by the PTO to train Examiners to comply with the Written Description Examination Guidelines in 66 Fed. Reg. 1099 (Jan. 5, 2001). Copies of Examples 9 and 10, which were attached to the July 11, 2005 response, are attached herewith along with Example 14.

On page 9 of the Advisory Action, the Office indicated that a discussion of the PTO's Written Description Examination Guidelines "appears to be misplaced" as they address the issue of written description and not enablement. However, this distinction was acknowledged in the last response. Moreover, as noted in the last response, the Examples and analysis in the Guidelines are instructive for the instant case even though the Guidelines deal with written description issues, as opposed to enablement. They are instructive for showing that PTO recognizes that the objected to claim language does not encompass the vast number of variants as asserted by the Office.

In Example 9, the claim is drawn to a genus of nucleic acids which hybridize under stringent conditions to a known DNA sequence, SEQ ID NO: 1, and encode a protein with a specific activity. There is a single species disclosed, i.e., SEQ ID NO: 1. Regarding the genus, it is clearly indicated that "a person of skill in the art would not expect substantial variation among species encompassed within the scope of the claims because the highly stringent conditions set forth in the claims yield structurally similar DNAs." Based on this example, it is clear that the PTO recognizes that hybridization under stringent conditions language does not encompass the vast number of variants as asserted in the rejection.

In Example 10, the claims are drawn to a process for producing an isolated DNA that hybridizes under stringent conditions to a known sequence and to the DNA sequences which

hybridize to the known sequence. This Example is illustrative of the fact that the PTO has recognized that there is no substantial variation within such a genus, because hybridization under stringent conditions yields structurally similar molecules.

In Example 14 of the Guidelines, a claim to variants of a disclosed protein was found to be valid when the claim was limited to variant sequences that are at least 95% identical of the disclosed sequence and retain the functionality of the disclosed protein. The Guidelines' analysis of the example indicated that the procedures for making variants which have 95% identity and retain the functional activity are conventional in the art. It was also found that substantial variations among the members of the genus did not exist, because all the variants must possess the specified functional activity and must have at least 95% identity to the disclosed reference sequence. This Example shows that the PTO has recognized that "at least 95% identity" language does not encompass the vast number of variants as asserted in the rejection.

Elements (c) and (d) of the instant claims are analogous to the claims analyzed in the above-described examples. Moreover, as recognized by the PTO in these examples, it is respectfully submitted that a person of skill in the art would not expect substantial variation among the species encompassed within the scope of the claims, because the highly stringent conditions set forth in the claims and the 95% homology language yield structurally similar DNAs.

In addition, as discussed in the prior responses, the courts have also recognized that the instant claim language is patentable and enabled. Please take note of the following decisions Enzo Biochem, Inc. v. Gen-Probe Inc., 323 F.3d 956, 967, 63 USPQ2d 1609, 1613 (Fed. Cir. 2002) and Ex parte Herrmann, No. 2002-1630 (BPAI 2003), copies of which were attached to the July 11, 2005 response. Courtesy copies of these decisions are also attached herewith.

In Enzo, the Federal Circuit held that "[a]dequate written description may be present for a genus of nucleic acids based on their hybridization properties, 'if they hybridize under highly

stringent conditions to known sequences because such conditions dictate that all species within the genus will be structurally similar.'" Enzo, 323 F3d. at 956, 63 USPQ2d at 1615.

The Board in Herrmann dealt with similar issues for a claim directed to a genus of DNA that hybridize under stringent conditions. The Board found that polynucleotides encompassed by the claims directed to DNA that hybridize under stringent conditions to known DNA "do not include the 'potentially infinite number of variants'" as posited by the Examiner. Herrmann, page 17.

Although these cases deal with written description issues as opposed to enablement, they are instructive as evidence that the courts and the PTO recognize that there is no substantial variation within a claimed genus of sequences having "at least 95% homology" to a known sequence or sequences which "hybridize under stringent conditions", because such claim language yields structurally similar molecules and excludes the vast majority of variants.

In addition, the Board in Ex parte Bandman No. 2003-1805 (BPAI 2004) considered a similar question as to whether there was written description support for a polynucleotide "at least 90% identical" to a disclosed sequence. A copy of Bandman is attached herewith.

In Bandman, the Examiner rejected the claimed polynucleotide on the basis that the "at least 90% identical" language with no functional limitation lacked written description support, because the specification provided only a single representative species and purportedly did not provide guidance as to which specific nucleotide residues can tolerate change without affecting the functional activity of the polypeptide encoded thereby. See page 4, lines 29-30 of Bandman. The Board disagreed and found that claims directed to polynucleotide sequence at least 90% identical to a disclosed polynucleotide sequence met the written description requirement. In particular, the Board in Bandman held (page 6, lines 17-18) that two limitations, i.e., "at least 90% identity" and "naturally occurring", adequately described the genus of polynucleotides encompassed by claims 33 b) without that the claim further including a functional limitation.

Accordingly, the Board held that disclosure of a sequence with no functional language provided written support for the "at least 10%" variance in the disclosed polynucleotide.

Furthermore, please note that the claims in the present application recite a functional limitation of PF1022 synthetase activity, which provides more written support than was the case in Bandman.

In addition, it is noted that claim 8 in Bandman was not rejected by the Examiner for it contained both an identity limitation and a functional limitation. Kindly note that claims 13 and 15 of the instant application similarly recite both "at least 95% homology" language and the enzyme activity. In other words, claims 13 and 15 of the instant application include both a percent homology limitation and a functional limitation, similar to non-rejected claim 8 in Bandman. Accordingly, it is respectfully submitted that claims 13 and 15 should also not be rejected.

Although Bandman is non-precedential and deals with written description, as opposed to enablement, the decision is instructive as evidence that the PTO recognizes that substantial variation does not exist within a claimed genus of sequences having "at least 90% identity" to a known sequence. Moreover, the claims in the instant application recite "at least 95% identical", which has even less variance than was the case in Bandman.

Furthermore, it is scientifically well established in the art that the term "stringent conditions" refers to hybridization and washing under conditions that permit only binding of a nucleic acid molecule, such as an oligonucleotide or cDNA molecule probe, to highly homologous sequences. Accordingly, sequences that hybridize under stringent conditions are limited to those sequences that form the requisite number of base pairs over the hybridizing sequence.

As recognized by the courts and the PTO, hybridization under the specified stringent conditions of the claims require that the nucleotide sequence be structurally similar to the nucleotide sequence of SEQ ID NO:1. Moreover, by using stringent conditions, the "vast

number" of variant polynucleotides would be excluded from the claims. In fact, most variants would simply not hybridize to SEQ ID NO:1 under such conditions. Consequently, the claims are of a much narrower scope than, for example, hybridization under non-stringent conditions. Thus, in contrast to the position taken in the Office, the polypeptides encompassed by claims 13 and 15 do not include a vast number of polypeptide variants of SEQ ID NO:2 having PF1022 synthetase activity.

Moreover, even assuming arguendo that the claims encompass a large number of polypeptide variants, which they do not, it would not take undue experimentation to make and use the full scope of the claims.

It is well established that the test of enablement is whether one reasonably skilled in the art could make or use the invention based on the disclosure in the specification coupled with the knowledge in the art without undue experimentation. The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. The test is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue. In fact, the test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. See M.P.E.P. § 2164.01.

The hybridization techniques and screening procedures disclosed in the specification are common and well known in the biotech industry as acknowledged by the PTO in Example 14 of the PTO's Written Description Guidelines. See the discussion above. As such, it would only require routine experimentation for the skilled artisan to isolate DNA that hybridizes under the specific stringent conditions of the claims to SEQ ID NO:1 or DNA that has at least 95% homology to SEQ ID NO: 1, and then produce the polypeptide encoded by these sequences. Likewise, it would only require routine experimentation to then test the polypeptides encoded by such for the PF1022, cyclic depsipeptide synthetase activity. Even if doing so would require a

"considerable amount" of experimentation, Appellants respectfully submit that it would be routine and not undue. Again, the test for enablement is not merely quantitatively, since a considerable amount of experimentation is permissible, with respect to the direction in which to proceed.

Accordingly, it is respectfully submitted that it would not take undue experimentation to utilize the routine techniques disclosed in the specification and known in the art to isolate the limited number of DNA that hybridize under stringent conditions to SEQ ID NO:1, or have at least 95% homology thereto, and then express the nucleotides to obtain the polypeptides encoded thereby, and then further test the limited number of polypeptides encoded by these nucleotides for the requisite PF1022 activity.

As to the Office's concern regarding a lack of a working example of a variant nucleotide, it is well established that a specification need not contain an example if the invention is otherwise disclosed in such manner that one skilled in the art will be able to practice it without an undue amount of experimentation. See M.P.E.P. § 2164.02. Again, it would not take undue experimentation to make and use the full scope of the claimed invention for the reasons discussed above.

On pages 5-11 of the Advisory Action and on pages 6-7 of the final Office Action, it was indicated that the hybridization under stringent conditions language in part (c) and the "at least 95% homology" language in part (d) of claims 13 and 15 are so broad as to encompass a vast number of nucleotide sequences encoding polypeptide variants having PF1022 synthetase activity, because the hybridization under stringent conditions corresponds to 85% identity and the "at least 95% homology" corresponds to 19^{3210} variants.

Appellants respectfully disagree with the interpretation and analysis in the Actions. While it is acknowledged that the instant claim language may encompass a large number of potential variants, most of the genus would retain the functional activity of the disclosed protein. It is respectfully submitted that the instant claim language allows for variation which is

sufficiently predictive such that one skilled in the art could practice the invention without undue experimentation. More importantly, even if this would require a "considerable amount" of experimentation, Appellants respectfully submit that it would be routine and not undue.

Lastly, it is again respectfully submitted that this rejection conflicts with accepted practice at the PTO regarding "at least 95% homology" and hybridization under stringent conditions claim language. Many thousands of such claims appear in issued U.S. patents. Attached to the July 11, 2005 response were results of an online search of the PTO database for claim language containing "stringent conditions" to show that the PTO has allowed over a thousand patents with such claim language. Furthermore, attached herewith are results of an online search of the PTO database for the "at least 95% homology". Courtesy copies of these searches are attached herewith. These results also which show that the PTO has allowed thousands of patents with such claim language.

While it is acknowledged that patentability must be determined on a case-by-case basis, the results of the online search demonstrate that the PTO has long accepted such language in the claims. Thus, it appears that the rejection conflicts with a well accepted practice at the PTO. If the Board were to decide otherwise, such decision would call into question the validity of thousands of issued patents in the biotech industry.

For these reasons, the scope of enablement rejection under 35 U.S.C. § 112, first paragraph, of claims 13 and 15 is untenable and should be reversed.

VIII. CONCLUSION

For the foregoing reasons, the specification fully enables one of skill in the art to make and use the invention of claims 13 and 15 without undue experimentation. Thus, reversal of the final rejection is respectfully requested.

Attached herewith are a Claims Appendix, an Evidence Appendix, and a Related Proceedings Appendix.

This brief is submitted in triplicate with the requisite fee of $500.00.

Respectfully submitted,

Naoki MIDOH et al.

By _____
Jay F. Williams
Registration No. 48,036
Attorney for Appellants

JFW/akl
Washington, D.C.
Telephone (202) 721-8200
Facsimile (202) 721-8250
June 30, 2006

CLAIMS APPENDIX

1. (Allowed) An isolated protein comprising the amino acid sequence of SEQ ID NO: 2.

2. (Withdrawn) A polynucleotide encoding the protein of claim 1.

3. (Withdrawn) A polynucleotide according to claim 2, which comprises the DNA sequence of SEQ ID NO: 1.

4. (Withdrawn) A polynucleotide selected from the group consisting of the following sequences:

(c) a DNA sequence of SEQ ID NO: 1,

(d) a nucleotide sequence that has at least 70% homology to the DNA sequence of SEQ ID NO: 1 and encodes a protein having cyclic depsipeptide synthetase activity,

(e) a modified DNA sequence of the DNA sequence of SEQ ID NO: 1 that has one or more modifications selected from a substitution, a deletion, an addition and an insertion and encodes a protein having cyclic depsipeptide synthetase activity, and

(f) a nucleotide sequence that hybridizes with the DNA sequence of SEQ ID NO: 1 under stringent conditions and encodes a protein having cyclic depsipeptide synthetase activity.

5. (Withdrawn) The polynucleotide according to claim 4, wherein sequence (d) is a nucleotide sequence that has at least 80% homology to the DNA sequence of SEQ ID NO: 1.

6. (Withdrawn) The polynucleotide according to claim 4, wherein sequence (d) is a nucleotide sequence that has at least 90% homology to the DNA sequence of SEQ ID NO: 1.

7. (Withdrawn) A recombinant vector comprising the polynucleotide of claim 2 or claim 4.

8. (Withdrawn) A host comprising the expression vector of claim 7.

9. (Withdrawn) The host according to claim 8, which expresses a cyclic depsipeptide synthetase.

10. (Withdrawn) The host according to claim 8, which is a substance PF1022-producing microorganism.

11. (Withdrawn) A method for producing a cyclic depsipeptide, which comprises the steps of culturing the host of claim 8 and collecting the cyclic depsipeptide from the culture medium.

12. (Withdrawn) The method according to claim 11, wherein the cyclic depsipeptide is the substance PF1022 and a derivative thereof.

13. (Appealed) A method for producing a protein having cyclo(D-lactyl-L-N-methylleucyl-D-3-phenyllactyl-L-N-methylleucyl-D-lactyl-L-N-methylleucyl-D-3-phenyllactyl-L-N-methylleucyl) (PF1022) synthetase activity, which comprises the steps of:

culturing a host cell transformed with a vector containing a nucleotide sequence under conditions suitable for protein expression, wherein the nucleotide sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 2;

(b) the nucleotide sequence of SEQ ID NO: 1;

(c) a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1 under stringent conditions at 0.2 x SSC concentration (1 x SSC: 15 mM trisodium citrate, 150 mM sodium chloride) in a 0.1 % SDS solution at 60°C for 15 minutes and which encodes a protein having PF1022 synthetase activity; and

(d) a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1 and which encodes a protein having PF1022 synthetase activity; and

collecting the protein from the culture medium.

14. (Cancelled)

15. (Appealed) An isolated protein encoded by a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 2;

(b) the nucleotide sequence of SEQ ID NO: 1;

(c) a nucleotide sequence that hybridizes with the nucleotide sequence of SEQ ID NO: 1 under stringent conditions at 0.2 x SSC concentration (1 x SSC: 15 mM trisodium citrate, 150 mM sodium chloride) in a 0.1 % SDS solution at 60°C for 15 minutes and which encodes a protein having PF1022 synthetase activity; and

(d) a nucleotide sequence that has at least 95% homology to the nucleotide sequence of SEQ ID NO: 1 and which encodes a protein having PF1022 synthetase activity.

16-17. (Cancelled)

EVIDENCE APPENDIX

1. Examples 9, 10 and 14 of the PTO's Revised Interim Written Description Guidelines Training Materials, which were drafted and used by the PTO to train Examiners to comply with the Written Description Examination Guidelines in 66 Fed. Reg. 1099 (Jan. 5, 2001);
2. Enzo Biochem, Inc. v. Gen-Probe Inc., 323 F.3d 956, 63 USPQ2d 1609 (Fed. Cir. 2002) (please note that the proper citation for Enzo is 323 F.3d 956 and not 296 F.3d 1316 as cited in the previous responses);
3. Ex parte Herrmann, No. 2002-1630 (BPAI 2003);
4. Ex parte Bandman No. 2003-1805 (BPAI 2004);
5. Results of an online search of the PTO database for claim language containing "stringent conditions" which show that the PTO has allowed over a thousand patents with such claim language; and
6. Results of an online search of the PTO database for "at least 95% homology", which show that the PTO has allowed thousands of patents with such claim language.

RELATED PROCEEDINGS APPENDIX

REVISED INTERIM WRITTEN DESCRIPTION GUIDELINES TRAINING MATERIALS

Contents

e.g. expression vectors, the necessary common attribute is the ORF (SEQ ID NO: 2).

Weighing all factors including (1) that the full length ORF (SEQ ID NO: 2) is disclosed and (2) that any substantial variability within the genus arises due to addition of elements that are not part of the inventor's particular contribution, taken in view of the level of knowledge and skill in the art, one skilled in the art would recognize from the disclosure that the applicant was in possession of the genus of DNAs that comprise SEQ ID NO: 2.

Conclusion: The written description requirement is satisfied.

Example 9: Hybridization

Specification: The specification discloses a single cDNA (SEQ ID NO:1) which encodes a protein that binds to a dopamine receptor and stimulates adenylate cyclase activity. The specification includes an example wherein the complement of SEQ ID NO: 1 was used under highly stringent hybridization conditions (6XSSC and 65 degrees Celsius) for the isolation of nucleic acids that encode proteins that bind to dopamine receptor and stimulate adenylate cyclase activity. The hybridizing nucleic acids were not sequenced. They were expressed and several were shown to encode proteins that bind to a dopamine receptor and stimulate adenylate cyclase activity. These sequences may or may not be the same as SEQ ID NO: 1.

Claim:

An isolated nucleic acid that specifically hybridizes under highly stringent conditions to the complement of the sequence set forth in SEQ ID NO: 1,

wherein said nucleic acid encodes a protein that binds to a dopamine receptor and stimulates adenylate cyclase activity.

Analysis:

A review of the full content of the specification indicates that the essential feature of the claimed invention is the isolated nucleic acid that hybridizes to SEQ ID NO: 1 under highly stringent conditions and encodes a protein with a specific function. The art indicates that hybridization techniques using a known DNA as a probe under highly stringent conditions were conventional in the art at the time of filing.

The claim is drawn to a genus of nucleic acids all of which must hybridize with SEQ ID NO: 1 and must encode a protein with a specific activity.

The search of the prior art indicates that SEQ ID NO: 1 is novel and unobvious.

There is a single species disclosed (a molecule consisting of SEQ ID NO: 1) that is within the scope of the claimed genus.

There is actual reduction to practice of the disclosed species.

Now turning to the genus analysis, a person of skill in the art would not expect substantial variation among species encompassed within the scope of the claims because the highly stringent hybridization conditions set forth in the claim yield structurally similar DNAs. Thus, a representative number of species is disclosed, since highly stringent hybridization conditions in combination with the coding function of DNA and the level of

skill and knowledge in the art are adequate to determine that applicant was in possession of the claimed invention.

Conclusion: The claimed invention is adequately described.

Example 10: Process claim

Specification: The specification teaches that SEQ ID NO: 10 is an EST. The specification also teaches that SEQ ID NO: 10 is a chromosome marker and that any DNA which hybridizes under specified stringent conditions to SEQ ID NO: 10 will be useful as a marker for detecting the presence of Burkitt's lymphoma. The specification also teaches how to produce DNAs including genomic DNAs which hybridize to SEQ ID NO: 10 and isolation of said DNAs. The specification presents an example where a genomic DNA is probed with SEQ ID NO: 10 under the specified stringent conditions (6XSSC and 65 degrees Celsius) and the genomic DNA which hybridizes under these conditions is isolated and is sequenced. The sequence of this genomic clone is represented by SEQ ID NO: 11.

Claim:

Claim 1: A process for producing an isolated polynucleotide comprising hybridizing SEQ ID NO: 10 to genomic DNA in 6XSSC and 65° C and isolating the DNA polynucleotide detected with SEQ ID NO: 10.

Claim 2: An isolated DNA that hybridizes with SEQ ID NO: 10.

Analysis:

Claim 1:

A review of the full content of the specification indicates that the essential feature of the claimed invention is a process of obtaining a nucleic acid sequence which is identified by a probe that hybridizes to SEQ ID NO:10 and a polynucleotide that hybridizes with SEQ ID NO: 10. The

specification and the general state of the art indicate that the general process of producing nucleic acids through hybridization with probes was routine at the time of filing.

The claim is drawn to a genus i.e., a process of hybridizing to genomic DNA with SEQ ID NO: 10 and isolating the DNA which hybridizes under specific conditions to said sequence.

The search indicates that SEQ ID NO: 10 and SEQ ID NO: 11 are novel and unobvious sequences. Therefore, under the examination guidelines of *In re Ochiai* and *In re Brouwer*, the method of making a novel and unobvious product is also novel and unobvious.

The specification presents an example where a single species has been reduced to practice, i.e., isolation of SEQ ID NO: 11 based on hybridization with SEQ ID NO: 10. Therefore the disclosed species within the genus has been adequately described. Now turning to the genus analysis, the art indicates that there is no substantial variation within the genus because of the stringency of hybridization conditions which yields structurally similar molecules. The single disclosed species is representative of the genus because reduction to practice of this species, considered along with the defined hybridization conditions and the level of skill and knowledge in the art, are sufficient to allow the skilled artisan to recognize that applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus.

Claim 2:

The claim is drawn to a genus of nucleic acids, all of which must hybridize to SEQ ID NO: 10. The claim does not specify any stringency conditions. The claim is broad and reads on virtually any nucleic acid.

There is a species disclosed, SEQ ID NO: 11. The art indicates that there is substantial variation within the genus because the lack of stringency of hybridization conditions would be expected to yield structurally unrelated nucleic acid molecules. The single disclosed species is not representative of the genus because there is no structural attribute or feature that is common to the members of the genus.

Conclusion:

Claim 1 is adequately described.

Claim 2 should be rejected as lacking adequate written description following the analysis described above.

Note: Applicant may overcome the written description rejection of the product by, for example, substituting claim 2 with a product by process claim such as the one below.

Claim 2. *The isolated DNA polynucleotide prepared according to the process of claim 1.*

Example 14: Product by Function

Specification: The specification exemplifies a protein isolated from liver that catalyzes the reaction of **A** $\longrightarrow$ **B.** The isolated protein was sequenced and was determined to have the sequence as set forth in SEQ ID NO: 3. The specification also contemplates but does not exemplify variants of the protein wherein the variant can have any or all of the following: substitutions, deletions, insertions and additions. The specification indicates that procedures for making proteins with substitutions, deletions, insertions and additions is routine in the art and provides an assay for detecting the catalytic activity of the protein.

Claim:

A protein having SEQ ID NO: 3 and variants thereof that are at least 95% identical to SEQ ID NO: 3 and catalyze the reaction of A $\longrightarrow$ B.

Analysis:

A review of the full content of the specification indicates that a protein having SEQ ID NO: 3 or variants having 95% identity to SEQ ID NO: 3 and having catalytic activity are essential to the operation of the claimed invention. The procedures for making variants of SEQ ID NO: 3 are conventional in the art and an assay is described which will identify other proteins having the claimed catalytic activity. Moreover, procedures for making variants of SEQ ID NO: 3 which have 95% identity to SEQ ID NO: 3 and retain its activity are conventional in the art.

A review of the claim indicates that variants of SEQ ID NO: 3 include but are not limited to those variants of SEQ ID NO: 3 with substitutions, deletions, insertions and additions; but all variants must possess the specified catalytic activity and must have at least 95% identity to the SEQ ID NO: 3. Additionally, the claim is drawn to a protein which **comprises** SEQ ID NO: 3 or a variant thereof that has 95% identity to SEQ ID NO: 3. In other words, the protein claimed may be larger than SEQ ID NO: 3 or its variant with 95% identity to SEQ ID NO: 3. It should be noted that "having" is open language, equivalent to "comprising".

The claim has two different generic embodiments, the first being a protein which comprises SEQ ID NO: 3 and the second being variants of SEQ ID NO: 3. There is a single species disclosed, that species being SEQ ID NO: 3.

A search of the prior art indicates that SEQ ID NO: 3 is novel and unobvious.

There is actual reduction to practice of the single disclosed species. The specification indicates that the genus of proteins that must be variants of SEQ ID NO: 3 does not have substantial variation since all of the variants must possess the specified catalytic activity and must have at least 95% identity to the reference sequence, SEQ ID NO: 3. The single species disclosed is representative of the genus because all members have at least 95% structural identity with the reference compound and because of the presence of an assay which applicant provided for identifying all of the at least 95% identical variants of SEQ ID NO: 3 which are capable of the specified catalytic activity. One of skill in the art would conclude that

applicant was in possession of the necessary common attributes possessed by the members of the genus.

Conclusion: The disclosure meets the requirements of 35 USC §112 first paragraph as providing adequate written description for the claimed invention.

H
Briefs and Other Related Documents

United States Court of Appeals,Federal Circuit.
ENZO BIOCHEM, INC., Plaintiff-Appellant,
v.
GEN-PROBE INCORPORATED,
andChugai Pharma U.S.A., Inc. and Chugai Pharmaceutical Co., Ltd.,
andBiomerieux, Inc.,
andBecton Dickinson and Company,
Defendants-Appellees,
andBiomerieux SA, Defendant.
No. 01-1230.

DECIDED: July 15, 2002.

Assignee of patent directed to nucleic acid probes that selectively hybridize to genetic material of bacteria that cause gonorrhea brought patent infringement suit against competitors, who moved for summary judgment. The United States District Court for the Southern District of New York, Alvin K. Hellerstein, J., granted motion. Assignee appealed. On grant of petition for rehearing, the Court of Appeals, Lourie, Circuit Judge, held that: (1) patent's reference to deposit in public depository can constitute adequate description of claimed material for purpose of written description requirement; (2) fact issues existed as to whether one skilled in the art would view various subsequences, mutations, and mixtures of deposited sequences as within scope of claims; (3) fact issues existed as to whether deposited sequences were representative of broader genus claims; (4) fact issues existed as to whether claimed sequences were adequately described in terms of function; and (5) specification's indication that assignee possessed claimed invention by reducing it to practice was insufficient alone to meet written description requirement.

Reversed and remanded.

Petition for rehearing en banc denied.

Lourie, Circuit Judge, filed an opinion concurring in denial of petition for rehearing en banc, in which Pauline Newman, Circuit Judge, joined.

Pauline Newman, Circuit Judge, filed an opinion concurring in denial of rehearing en banc.

Dyk, Circuit Judge, filed an opinion concurring in denial of rehearing en banc.

Rader, Circuit Judge, filed an opinion dissenting from denial of rehearing en banc, in which Gajarsa and Linn, Circuit Judges, joined.

Opinion, 285 F.3d 1013, vacated.

West Headnotes

[1] Patents 291 ⚿112.5

291 Patents
291IV Applications and Proceedings Thereon
291k112 Conclusiveness and Effect of Decisions of Patent Office
291k112.5 k. Sufficiency of Evidence to Offset Effect of Decision in General. Most Cited Cases
A patent is presumed to be valid, and this presumption can be overcome only by facts supported by clear and convincing evidence to the contrary. 35 U.S.C.A. § 282.

[2] Patents 291 ⚿314(5)

291 Patents
291XII Infringement
291XII(C) Suits in Equity
291k314 Hearing
291k314(5) k. Questions of Law or Fact. Most Cited Cases
Compliance with the patent statute's written description requirement is a question of fact. 35 U.S.C.A. § 112.

[3] Patents 291 ⚿99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Written description requirement of patent statute calls for a written description of an invention separate from enablement. 35 U.S.C.A. § 112.

[4] Patents 291 ⚿99

291 Patents

291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Compliance with the patent statute's written description requirement is essentially a fact-based inquiry that will necessarily vary depending on the nature of the invention claimed. 35 U.S.C.A. § 112.

[5] Patents 291 97

291 Patents
291IV Applications and Proceedings Thereon
291k97 k. Patent Office and Proceedings Therein in General. Most Cited Cases
Regulatory guidelines governing internal practice of Patent and Trademark Office (PTO) for examining patent applications under statutory written description requirement, like the Manual of Patent Examining Procedure (MPEP), are not binding on Court of Appeals, but may be given judicial notice to the extent they do not conflict with the statute. 35 U.S.C.A. § 112.

[6] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Patent statute's written description requirement can be met by showing that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics. 35 U.S.C.A. § 112.

[7] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Reference in patent specification to deposits of claimed nucleotide sequences in public depository sufficiently described those sequences to the public for purposes of patent statute's written description requirement; a person of skill in the art, reading the accession numbers in the patent specification, could obtain claimed sequences from depository by following the appropriate techniques to excise the nucleotide sequences from the deposited organisms containing those sequences, and, although structures of those sequences were not expressly set forth in the specification, those structures may not have been reasonably obtainable and in any event were not known to patent applicant when application was filed. 35 U.S.C.A. § 112.

[8] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Reference in patent specification to a deposit in a public depository, which makes its contents accessible to the public when it is not otherwise available in written form, constitutes an adequate description of the deposited material sufficient to comply with the patent statute's written description requirement. 35 U.S.C.A. § 112.

[9] Federal Civil Procedure 170A 2508

170A Federal Civil Procedure
170AXVII Judgment
170AXVII(C) Summary Judgment
170AXVII(C)2 Particular Cases
170Ak2508 k. Patent Cases. Most Cited Cases
Genuine issue of material fact as to whether three claimed nucleotide sequences placed in public depository also described various subsequences, mutations, and mixtures of those sequences, which allegedly also fell within scope of patent claims, to one skilled in the art precluded summary judgment for alleged infringer, who asserted that such substantial breadth of claims would render them invalid under the written description requirement. 35 U.S.C.A. § 112.

[10] Federal Civil Procedure 170A 2508

170A Federal Civil Procedure
170AXVII Judgment
170AXVII(C) Summary Judgment
170AXVII(C)2 Particular Cases
170Ak2508 k. Patent Cases. Most Cited Cases
Genuine issue of material fact as to whether three claimed nucleotide sequences placed in public depository were representative, to one skilled in the art, of broad genus claims, in patent directed to nucleic acid probes that selectively hybridize to the genetic material of the bacteria that cause gonorrhea, precluded summary judgment for alleged infringer on

its claim that genus claims were invalid for failure to meet patent statute's written description requirement. 35 U.S.C.A. § 112.

[11] Federal Civil Procedure 170A 2508

170A Federal Civil Procedure
170AXVII Judgment
170AXVII(C) Summary Judgment
170AXVII(C)2 Particular Cases
170Ak2508 k. Patent Cases. Most Cited Cases
Genuine issue of material fact as to whether disclosed correlation of their function of hybridization with bacterial DNA strains deposited in public depository described claimed nucleotide sequences, in patent directed to nucleic acid probes that selectively hybridized to genetic material of bacteria that caused gonorrhea, even though DNA structures were not explicitly sequenced, precluded summary judgment for alleged infringer on its claim that patent was invalid for failure to meet the written description requirement. 35 U.S.C.A. § 112.

[12] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Fact that claims of patent directed to nucleic acid probes that selectively hybridize to the genetic material of the bacteria that cause gonorrhea appeared in ipsis verbis in the written description did not automatically satisfy written description requirement of patent statute. 35 U.S.C.A. § 112.

[13] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Even if a patent claim is supported by the specification, the language of the specification, to the extent possible, must describe the claimed invention so that one skilled in the art can recognize what is claimed; the appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement. 35 U.S.C.A. § 112.

[14] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
A description of what a material does, rather than of what it is, usually does not suffice to meet the patent statute's written description requirement; disclosure must allow one skilled in the art to visualize or recognize the identity of the subject matter purportedly described. 35 U.S.C.A. § 112.

[15] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Where the words of the patent claim alone do not convey an adequate description of the invention, regardless of whether the claim appears in the original specification and is thus supported by the specification as of the filing date, the patent statute's written description requirement is not necessarily met. 35 U.S.C.A. § 112.

[16] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
If a purported description of an invention does not meet patent statute's written description requirement, the fact that it appears as an original claim or in the specification does not save it; a claim does not become more descriptive by its repetition, or its longevity. 35 U.S.C.A. § 112.

[17] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Mere fact that specification of patent, which was directed to nucleic acid probes that selectively hybridize to the genetic material of the bacteria that cause gonorrhea, indicated that patent holder possessed claimed invention by reducing to practice three nucleotide sequences within the scope of the patent claims and depositing them in public depository did not establish that patent met the statutory written description requirement. 35 U.S.C.A. § 112.

[18] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
While articulation of written description requirement of patent statute in terms of "possession" is useful when a patentee is claiming entitlement to an earlier filing date, in interferences in which the issue is whether a count is supported by the specification of one or more of the parties, and in ex parte applications in which a claim at issue was filed subsequent to the application, application of written description requirement is not subsumed by the "possession" inquiry. 35 U.S.C.A. § 112.

[19] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
A showing that the patentee is in "possession" of the claimed invention is ancillary to the statutory mandate of an adequate written description, and that requirement is not met if, despite a showing of possession, the specification does not adequately describe the claimed invention. 35 U.S.C.A. § 112.

[20] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Although one can show possession of an invention by means of an affidavit or declaration during prosecution, as one does in an interference or when one files an affidavit to antedate a reference, such a showing of possession does not substitute for a written description in the specification, as required by patent statute. 35 U.S.C.A. § 112.

[21] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Proof of a reduction to practice, absent an adequate description in the specification of what is reduced to practice, does not serve to describe or identify the invention for purposes of the patent statute's written description requirement. 35 U.S.C.A. § 112.

[22] Patents 291 99

291 Patents
291IV Applications and Proceedings Thereon
291k99 k. Description of Invention in Specification. Most Cited Cases
Written description requirement is the quid pro quo of the patent system; the public must receive meaningful disclosure in exchange for being excluded from practicing the invention for a limited period of time. 35 U.S.C.A. § 112.

*959 Richard L. Delucia,Kenyon & Kenyon, of New York, NY, filed a petition for rehearing en banc for plaintiff-appellant. With him on the petition were Charles A. Weiss and Bradley S. Corsello.
The appellees filed a consolidated response to the petition for rehearing en banc. William F. Lee, Hale and Dorr LLP, of Boston, MA, for defendant-appellee Gen-Probe Incorporated. With him on the response was William G. McElwain.
Robert J. Gunther, Jr., Latham & Watkins, of New York, NY, for defendants-*960 appellees Chugai Pharma U.S.A., Inc. and Chugai Pharmaceutical Co., Ltd. With him on the response was Jeffrey A. Tochner. Of counsel was Kurt M. Rogers.
Daniel A. Boehnen, McDonnell Boehnen Hulbert & Berghoff, of Chicago, IL, for defendant-appellee Biomerieux, Inc. With him on the response was Joshua R. Rich.
Donald R. Ware, Foley Hoag & Eliot LLP, of Boston, MA, for defendant-appellee Becton Dickinson and Company. With him on the response was Barbara A. Fiacco.
Frank P. Porcelli, Fish & Richardson P.C., of Boston, MA, filed a brief for amicus curiae Fish & Richardson P.C. Of counsel on the brief were Robert E. Hillman and Charles H. Sanders.
Mark S. Davies, Attorney, Appellate Staff, Civil Division, Department of Justice, of Washington, DC, filed an amicus curiae brief for the United States in support of rehearing en banc. With him on the brief were Robert D. McCallum, Jr., Assistant Attorney General, and Scott R. McIntosh, Attorney. Of counsel on the brief was John M. Whealan, Solicitor, U.S. Patent and Trademark Office, of Arlington, Virginia.

Before LOURIE, DYK and PROST, Circuit Judges.

ON PETITION FOR REHEARING

LOURIE, Circuit Judge.
Enzo Biochem, Inc. petitions for rehearing of this

appeal following our prior decision, reported at 285 F.3d 1013, 62 USPQ2d 1289 (Fed.Cir.2002), in which we affirmed the decision of the United States District Court for the Southern District of New York. The district court had granted Gen-Probe Incorporated, Chugai Pharma U.S.A., Inc., Chugai Pharmaceutical Co., Ltd., Biomerieux, Inc., Biomerieux SA, and Becton Dickinson and Company's (collectively, "the defendants") motion for summary judgment that claims 1-6 of U.S. Patent 4,900,659 are invalid for failure to meet the written description requirement of 35 U.S.C. § 112, ¶ 1. *Enzo Biochem, Inc. v. Gen-Probe Inc.*, No. 99 Civ. 4548 (S.D.N.Y. Apr. 4, 2001) (final order). Having considered Enzo's petition for rehearing and the defendants' response, [FN1] we have determined that our prior decision that a deposit may not satisfy the written description requirement was incorrect. We therefore grant Enzo's petition for rehearing, vacate the prior decision, and reverse the district court's grant of summary judgment that Enzo's claims are invalid for failure to meet the written description requirement. Because genuine issues of material fact exist regarding satisfaction of the written description requirement, we remand.

FN1. *Amicus curiae* briefs were filed by the United States Patent and Trademark Office and Fish & Richardson P.C.

BACKGROUND

Enzo is the assignee of the 659 patent, which is directed to nucleic acid probes that selectively hybridize to the genetic material of the bacteria that cause gonorrhea, *Neisseria gonorrhoeae*. *N. gonorrhoeae* reportedly has between eighty and ninety-three percent homology with *Neisseria meningitidis*. 659 patent, col. 2, ll. 61-64. Such a high degree of homology has made detection of *N. gonorrhoeae* difficult, as any probe capable of detecting *N. gonorrhoeae* may also show a positive result when only *N. meningitidis* is present. Enzo recognized the need for a chromosomal DNA probe specific for *N. *961 gonorrhoeae*, and it derived three such sequences that preferentially hybridized to six common strains of *N. gonorrhoeae* over six common strains of *N. meningitidis*. Id. at col. 3, l. 49 to col. 4, l. 14; col. 4, ll. 45-50. The inventors believed that if the preferential hybridization ratio of *N. gonorrhoeae* to *N. meningitidis* were greater than about five to one, then the "discrete nucleotide sequence [would] hybridize to virtually all strains of *Neisseria gonorrhoeae* and to no strain of *Neisseria meningitidis*." Id. at col. 12, ll. 60-65. The three sequences that the inventors actually derived had a selective hybridization ratio of greater than fifty. Id. at col. 13, ll. 9-15. Enzo deposited those sequences in the form of a recombinant DNA molecule within an *E. coli* bacterial host at the American Type Culture Collection. Id. at col. 13, ll. 27-31.

Claim 1 is as follows:

1. A composition of matter that is specific for *Neisseria gonorrhoeae* comprising at least one nucleotide sequence *for which the ratio of the amount of said sequence which hybridizes to chromosomal DNA of Neisseria gonorrhoeae to the amount of said sequence which hybridizes to chromosomal DNA of Neisseria meningitidis is greater than about five,* said ratio being obtained by a method comprising the following steps;

(a) providing a radioactively labeled form of said nucleotide sequence;

(b) providing a serial dilution series of purified chromosomal DNA from each of the *N. gonorrhoeae* strains; (1) ATCC 53420, (2) ATCC 53421, (3) ATCC 53422, (4) ATCC 53423, (5) ATCC 53424, (6) ATCC 53425, and forming test dots from each of said dilution series on a matrix;

(c) providing a serial dilution series of purified nucleotide sequences from each of the *N. meningitidis* strains: (1) ATCC 53414, (2) ATCC 53415, (3) ATCC 53416, (4) ATCC 53417, (5) ATCC 53418, (6) ATCC 53419, and forming test dots from each of said dilution series on a matrix;

(d) hybridizing equal portions of the labeled nucleotide sequences to the matrix provided in step (b) and (c), respectively; wherein the hybridization is conducted in a solution having a salt concentration of 2X SSC at (i) 65°C. in cases in which the sequence has greater than 50 base pairs or (ii) at Tm (°C.) minus 30°C. in cases in which the sequence has less than 50 base pairs, wherein Tm is the denaturation temperature of the sequence;

(e) quantifying the labeled nucleotide sequence hybridized in step (d) to each test dot;

(f) subtracting from the data of step

(e) an averaged amount of radioactivity attributable to background to obtain a corrected amount of hybridized radioactivity at each test dot;

(g) normalizing the data of step (f) by multiplying the amount of corrected radioactivity at each test dot by a factor which adjusts the amount of radioactivity to equal amounts of chromosomal DNA at each test dot;

(h) selecting two normalized values that are most nearly the same and that correspond to adjacent members of the dilution series for each of the above strains of *N. gonorrhoeae* and obtaining the average of the selected values;

(i) selecting two normalized values that are most nearly the same and that correspond to adjacent members of the dilution series for each of the above strains of *N. meningitidis* and ***962** obtaining the average of the selected values;
(j) dividing the lowest average obtained in step (h) by the highest average obtained in step (i) to obtain said ratio.

Id. at col. 27, l. 29 to col. 28, l. 27 (emphasis added). Claims 2 and 3 depend from claim 1 and further limit the hybridization ratio to greater than about twenty-five and fifty, respectively. *Id.* at col. 2, ll. 27-30. Claim 4 is directed to the three deposited sequences (referenced by their accession numbers) and variants thereof as follows:4. The composition of claim 1 wherein said nucleotide sequences are selected from the group consisting of:
a. the *Neisseria gonorroheae* [sic] DNA insert of ATCC 53409, ATCC 53410 and ATCC 53411, and discrete nucleotide subsequences thereof,
b. mutated discrete nucleotide sequences of any of the foregoing inserts that are within said hybridization ratio and subsequences thereof; and
c. mixtures thereof.

Id. at col. 28, ll. 31-39. Claim 5 is directed to an assay for detection of *N. gonorrhoeae* using the composition of claim 1. *Id.* at ll. 40-46. Claim 6 further limits the method of claim 5 to the nucleotide sequences that Enzo deposited (*i.e.*, those in claim 4) and variants thereof. *Id.* at ll. 47-56.

Enzo sued the defendants for infringement of the 659 patent, and the defendants moved for summary judgment that the claims were invalid for failure to meet the written description requirement of 35 U.S.C. § 112, ¶ 1. The district court, in oral remarks from the bench, granted that motion. Tr. of Hr'g at 42, *Enzo Biochem, Inc. v. Gen-Probe, Inc.*, No. 99-CV-4548 (S.D.N.Y. Jan. 24, 2001). It concluded that the claimed composition of matter was defined only by its biological activity or function, *viz.*, the ability to hybridize to *N. gonorrhoeae* in a ratio of better than about five with respect to *N. meningitidis*, which it was held was insufficient to satisfy the § 112, ¶ 1 requirement set forth in this court's holdings in *Regents of the University of California v. Eli Lilly & Co.*, 119 F.3d 1559, 43 USPQ2d 1398 (Fed.Cir.1997), *Fiers v. Revel*, 984 F.2d 1164, 25 USPQ2d 1601 (Fed.Cir.1993), and *Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed.Cir.1991). Tr. of Hr'g at 28. The court rejected Enzo's argument that the reference in the specification to the deposits of biological materials in a public depository inherently disclosed that the inventors were in possession of the claimed sequences. *Id.* at 35. It distinguished this court's precedents concerning deposits as relating to the enablement requirement of § 112, ¶ 1. *Id.* at 38-40. Enzo appealed to this court; we have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

DISCUSSION

[1][2] Summary judgment is appropriate when there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. Fed.R.Civ.P. 56(c); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247-48, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986). On motion for summary judgment, the court views the evidence and any disputed factual issues in the light most favorable to the party opposing the motion. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587, 106 S.Ct. 1348, 89 L.Ed.2d 538 (1986). A patent is presumed to be valid, 35 U.S.C. § 282 (1994), and this presumption can be overcome only by facts supported by clear and convincing evidence to the contrary, *see, e.g., WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1396-97 (Fed.Cir.1999). Compliance with the written description ***963** requirement is a question of fact. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1116 (Fed.Cir.1991).

Enzo argues that the testimony of its expert, Dr. Wetmer, raised a genuine factual issue whether the reference to the deposits inherently described the claimed nucleotide sequences. Enzo also argues that its description of the binding affinity of the claimed nucleotide sequences satisfies the requirement set forth in the Guidelines for Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, 66 Fed. Reg. 1099 (Jan. 5, 2001) ("*Guidelines*"). Enzo asserts that the court erred in not evaluating the patentability of the claims separately, pointing out that claims 4 and 6 are directed to the three deposited sequences and variations and mixtures thereof. Enzo further asserts that the claims *per se* meet the written description requirement because they appear *in ipsis verbis* in the written description. Enzo also argues that this court's articulation of the written description requirement for genetic material in *Eli Lilly* should not apply to this case because Enzo reduced the invention to practice and deposited the derived biological materials, thereby demonstrating its "possession" of the invention.

The defendants respond that the district court properly granted summary judgment because the patent described the claimed nucleotide sequences only by their function, which they state is insufficient to meet the requirements of § 112, ¶ 1 as a matter of law, even as to the narrower claims directed to the deposited materials. The defendants also assert that Dr. Wetmur's opinion that the deposited genetic materials could have been sequenced did not cure the actual failure of the inventors to identify them by some distinguishing characteristic, such as their structure. Moreover, the defendants point out that claims 4 and 6, which are directed to the deposited materials, each cover a broad genus of nucleic acids. The defendants also urge that *in ipsis verbis* support for the claims in the specification does not *per se* establish compliance with the written description requirement. Finally, the defendants assert that the district court did not err in its determination that Enzo's "possession" of three nucleotide sequences that it reduced to practice and deposited nevertheless did not satisfy the written description requirement of § 112, ¶ 1.

[3][4] The written description requirement of § 112, ¶ 1 is set forth as follows:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. § 112, ¶ 1 (1994) (emphasis added). We have interpreted that section as requiring a "written description" of an invention separate from enablement. *Vas-Cath,* 935 F.2d at 1563, 19 USPQ2d at 1117 (recognizing the severability of the "written description" and "enablement" provisions of § 112, ¶ 1). Compliance with the written description requirement is essentially a fact-based inquiry that will "necessarily vary depending on the nature of the invention claimed." *Id.* (citing *In re DiLeone,* 58 C.C.P.A. 925, 436 F.2d 1404, 1405, 168 USPQ 592, 593 (1971)). We have also previously considered the written description requirement as applied to certain biotechnology patents, in which a gene material has been defined only by a statement of function or result, and have held that ***964** such a statement alone did not adequately describe the claimed invention. *Eli Lilly,* 119 F.3d at 1568, 43 USPQ2d at 1406. In *Eli Lilly,* we concluded that a claim to a microorganism containing a human insulin cDNA was not adequately described by a statement that the invention included human insulin cDNA. *Id.* at 1567, 43 USPQ2d at 1405. The recitation of the term human insulin cDNA conveyed no distinguishing information about the identity of the claimed DNA sequence, such as its relevant structural or physical characteristics. *Id.* We stated that an adequate written description of genetic material " 'requires a precise definition, such as by structure, formula, chemical name, or physical properties,' not a mere wish or plan for obtaining the claimed chemical invention," and that none of those descriptions appeared in that patent. *Id.* at 1566, 43 USPQ2d at 1404 (quoting *Fiers,* 984 F.2d at 1171, 25 USPQ2d at 1606). The specification in the *Eli Lilly* case thus did not show that the inventors had possession of human insulin cDNA.

[5][6] It is not correct, however, that all functional descriptions of genetic material fail to meet the written description requirement. The PTO has issued Guidelines governing its internal practice for addressing that issue. The Guidelines, like the Manual of Patent Examining Procedure ("MPEP"), are not binding on this court, but may be given judicial notice to the extent they do not conflict with the statute. *See Molins PLC v. Textron, Inc.,* 48 F.3d 1172, 1180 n. 10, 33 USPQ2d 1823, 1828 n. 10 (Fed.Cir.1995). In its Guidelines, the PTO has determined that the written description requirement can be met by "show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics ... *i.e.,* complete or partial structure, other physical and/or chemical properties, *functional characteristics when coupled with a known or disclosed correlation between function and structure,* or some combination of such characteristics." *Guidelines,* 66 Fed. Reg. at 1106 (emphasis added). For example, the PTO would find compliance with 112, 1, for a claim to an isolated antibody capable of binding to antigen X, notwithstanding the functional definition of the antibody, in light of the well defined structural characteristics for the five classes of antibody, the functional characteristics of antibody binding, and the fact that the antibody technology is well developed and mature. Synopsis of Application of Written Description Guidelines, at 60, *available at* http:// www.uspto.gov/web/patents/guides.htm (*Application of Guidelines*). Thus, under the Guidelines, the written description requirement would be met for all of the claims of the 659 patent if the functional characteristic of preferential binding to *N. gonorrhoeae* over *N. meningitidis* were coupled with a disclosed correlation between that function and a structure that is sufficiently known or disclosed. We are persuaded by the Guidelines on this point and adopt the PTO's applicable standard for determining

compliance with the written description requirement.

Applying those principles, we first inquire whether Enzo's deposits of the claimed nucleotide sequences of claims 4 and 6 may constitute an adequate description of those sequences. Secondly, we will consider whether the description requirement is met for all of the claims on the basis of the functional ability of the claimed nucleotide sequences to hybridize to strains of *N. gonorrhoeae* that are accessible by deposit.

[7][8] As to the first question, Enzo asserts that the claimed sequences are inherently described by reference to deposits of three sequences that are within the ***965** scope of its claims. Whether reference to a deposit of a nucleotide sequence may adequately describe that sequence is an issue of first impression in this court. In light of the history of biological deposits for patent purposes, the goals of the patent law, and the practical difficulties of describing unique biological materials in a written description, we hold that reference in the specification to a deposit in a public depository, which makes its contents accessible to the public when it is not otherwise available in written form, constitutes an adequate description of the deposited material sufficient to comply with the written description requirement of § 112, ¶ 1.

The practice of depositing biological material arose primarily to satisfy the enablement requirement of § 112, ¶ 1. For example, in *In re Argoudelis*, the patent application claimed antibiotic compounds that were produced by a microorganism. 58 C.C.P.A. 769, 434 F.2d 1390, 1390, 168 USPQ 99, 100 (1970). The applicants deposited the microorganism because they could not "sufficiently disclose by written word how to obtain the microorganism starting material from nature." *Id.* at 1392, 168 USPQ at 102. By making the biological material accessible to the public, they enabled the public to make and use the claimed antibiotics. *Id.* at 1393, 168 USPQ at 102-03. In *Amgen,* we noted the relevance of deposit practice to satisfaction of the enablement requirement but rejected the defendants' argument that a deposit was necessary in that case to satisfy the best mode requirement of § 112, ¶ 1. *See* 927 F.2d at 1210, 18 USPQ2d at 1024; *see also In re Lundak,* 773 F.2d 1216, 1217, 227 USPQ 90, 92 (Fed.Cir.1985) (discussing deposit practice primarily in relation to an enablement rejection and noting that "[a]n accession number and deposit date add nothing to the written description of the invention" in the context of proven availability of a cell line prior to filing date).

Recognizing the importance of biological deposits to patent practice, the PTO has promulgated rules to address the procedural requirements relating to such deposits, but it has declined to expressly correlate substantive requirements relating to deposits with particular statutory requirements. *See* Deposit of Biological Materials for Patent Purposes, 53 Fed. Reg. 39,420, 39,425 (Oct. 6, 1988) (notice of proposed rules) (codified at 37 C.F.R. Part 1) ("The rules are not intended to address which requirements of 35 U.S.C. 112 may be met by the making of deposits."). The Office does offer guidance, however, in determining when a deposit may be necessary, such as "[w]here the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible manner." MPEP § 2402 (8th ed. Aug. 2001). The PTO has also issued a regulation stating when a deposit is not necessary, *i.e.,* "if it is known and readily available to the public or can be made or isolated without undue experimentation." 37 C.F.R. § 1.802(b) (2001). Inventions that cannot reasonably be enabled by a description in written form in the specification, but that otherwise meet the requirements for patent protection, may be described in surrogate form by a deposit that is incorporated by reference into the specification. While deposit in a public depository most often has pertained to satisfaction of the enablement requirement, we have concluded that reference in the specification to a deposit may also satisfy the written description requirement with respect to a claimed material.

In this case, Enzo's deposits were incorporated by reference in the specification. A person of skill in the art, reading the ***966** accession numbers in the patent specification, can obtain the claimed sequences from the ATCC depository by following the appropriate techniques to excise the nucleotide sequences from the deposited organisms containing those sequences. 659 patent, col. 13, ll. 27-36. The sequences are thus accessible from the disclosure in the specification. Although the structures of those sequences, *i.e.,* the exact nucleotide base pairs, are not expressly set forth in the specification, those structures may not have been reasonably obtainable and in any event were not known to Enzo when it filed its application in 1986. *See* 659 patent, col. 3, ll. 40-46 (noting severe time constraints in sequencing DNA). We therefore agree with Enzo that reference in the specification to deposits of nucleotide sequences describe those sequences sufficiently to the public for purposes of meeting the written description requirement.

[9] As the defendants point out, however, Enzo's claims 4 and 6 are not limited to the deposited

sequences. Claim 4 is directed to nucleotide sequences that are selected from the group consisting of the three deposited sequences, "discrete nucleotide subsequences thereof ... mutated discrete nucleotide sequences of any of the foregoing inserts that are within said hybridization ratio and subsequences thereof[,] and ... mixtures thereof." 659 patent, col. 28, ll. 31-39. Claim 6 is also similarly directed to the three deposited sequences and subsequences and mutated variations thereof. *Id.* at ll. 47-56. The specification defines a subsequence non-specifically as a nucleotide sequence "greater than about 12 nucleotides." 659 patent, col. 3, ll. 29-30. As the deposited sequences are about 850, 850, and 1300 nucleotides long, *id.* at col. 13, ll. 47-49, there are at least hundreds of subsequences of the deposited sequences, an unknown number of which might also meet the claimed hybridization ratio. Moreover, Enzo's expert, Dr. Wetmur, stated that "astronomical" numbers of mutated variations of the deposited sequences also fall within the scope of those claims, and that such broad claim scope is necessary to adequately protect Enzo's invention from copyists who could otherwise make a minor change to the sequence and thereby avoid infringement while still exploiting the benefits of Enzo's invention. The defendants assert that such breadth is fatal to the adequacy of the written description. On the other hand, because the deposited sequences are described by virtue of a reference to their having been deposited, it may well be that various subsequences, mutations, and mixtures of those sequences are also described to one of skill in the art. We regard that question as an issue of fact that is best resolved on remand.[FN2] Because the district court's grant of summary judgment was based on its conclusion that Enzo's deposits could not satisfy the written description requirement as a matter of law, we reverse the district court's grant of summary judgment that claims 4 and 6 are invalid for failure to meet the written description requirement. On remand, the court should determine whether a person of skill in the art would glean from the written description, including information obtainable from the deposits of the claimed sequences, subsequences, mutated variants, and mixtures sufficient to demonstrate possession of the generic scope of the claims.

> FN2. We do not address the issue whether the breadth of the claim may implicate other validity issues, such as enablement. Only written description is before us.

[10] We next address the question whether the compositions of the broader genus claims 1-3 and 5 are sufficiently ***967** described to meet the requirements of § 112, ¶ 1, on the basis of Enzo's deposits of three sequences. If those sequences are representative of the scope of the genus claims, *i.e.*, if they indicate that the patentee has invented species sufficient to constitute the genera, they may be representative of the scope of those claims. *See In re Smythe*, 480 F.2d 1376, 1383, 178 USPQ 279, 284-85 (CCPA 1973) (discussing circumstances in which a species may be representative of and therefore descriptive of genus claims). Because the district court concluded that the deposited sequences were not themselves described, it did not determine whether that description was representative of the genera in those claims. Such determination should be made on remand.

When we addressed a similar issue in *Eli Lilly*, we determined that a disclosure of the sequence of rat cDNA was not descriptive of the broader invention consisting of mammalian and vertebrate cDNA, although it was a species falling within the scope of those claims. *Eli Lilly*, 119 F.3d at 1567-68, 43 USPQ2d at 1405. In *Eli Lilly*, the specification and generic claims to all cDNAs encoding for vertebrate or mammalian insulin did not describe the claimed genus because they did not set forth any common features possessed by members of the genus that distinguished them from others. *Id.* at 1568, 43 USPQ2d at 1405. Nor did the specification describe a sufficient number of species within the very broad genus to indicate that the inventors had made a generic invention, *i.e.*, that they had possession of the breadth of the genus, as opposed to merely one or two such species. *Id.* The PTO has included a hypothetical example based on the facts of *Eli Lilly* in its Synopsis of Application of Written Description Guidelines in which the description requirement is not met. *See Application of Guidelines*, Example 17, at 61-64. The PTO has also provided a contrasting example of genus claims to nucleic acids based on their hybridization properties, and has determined that such claims may be adequately described if they hybridize under highly stringent conditions to known sequences because such conditions dictate that all species within the genus will be structurally similar. *See id.*, Example 9, at 35-37. Whether the disclosure provided by the three deposits in this case, coupled with the skill of the art, describes the genera of claims 1-3 and 5 is a fact question the district court did not address. On remand, the district court should determine, consistently with the precedent of this court and the PTO's Guidelines, whether one skilled in the art would consider the subject matter of claims 1-3 and 5 to be adequately

described, recognizing the significance of the deposits and the scope of the claims.

[11] Enzo argues that all of the claims are adequately described on another basis, *viz.,* by means of the disclosed correlation of the function of hybridization with the bacterial DNA. In its petition for rehearing, Enzo states as attorney argument that "[t]he description and claiming of biological materials by their affinity to other materials that are clearly identified in the specification and claims (the particular deposited strains of *N. gonorrhoeae* and *N. meningitidis*) inherently specifies structure, and is routine in this field." Claim 1 sets forth the deposit numbers of six strains of *N. gonorrhoeae* to which the claimed nucleotide sequences preferentially hybridize, as well as the deposit numbers of six strains of *N. meningitidis* that are thereby distinguished. Again, as with the claimed nucleotide sequences, the sequences of the genomic DNA of those bacteria are not disclosed, perhaps because such sequencing would have been unduly burdensome at the time of Enzo's invention.***968** 659 patent, col. 3, ll. 40-46 (noting that it would take 3,000 scientists one month to sequence the genome of one strain of *N. gonorrhoeae* and one strain of *N. meningitidis*). However, as those bacteria were deposited, their bacterial genome is accessible and, under our holding today, they are adequately described in the specification by their accession numbers. Because the claimed nucleotide sequences preferentially bind to the genomic DNA of the deposited strains of *N. gonorrhoeae* and have a complementary structural relationship with that DNA, those sequences, under the PTO Guidelines, may also be adequately described. Although the patent specification lacks description of the location along the bacterial DNA to which the claimed sequences bind, Enzo has at least raised a genuine issue of material fact as to whether a reasonable fact-finder could conclude that the claimed sequences are described by their ability to hybridize to structures that, while not explicitly sequenced, are accessible to the public. Such hybridization to disclosed organisms may meet the PTO's Guidelines stating that functional claiming is permissible when the claimed material hybridizes to a disclosed substrate. That is a fact question. We therefore conclude that the district court erred in granting summary judgment that the claims are invalid for failure to meet the written description requirement. On remand, the court should consider whether one of skill in the art would find the generically claimed sequences described on the basis of Enzo's disclosure of the hybridization function and an accessible structure, consistent with the PTO Guidelines. If so, the written description requirement would be met.

[12][13][14] We next address Enzo's additional argument that the written description requirement for the generic claims is necessarily met as a matter of law because the claim language appears *in ipsis verbis* in the specification. We do not agree. Even if a claim is supported by the specification, the language of the specification, to the extent possible, must describe the claimed invention so that one skilled in the art can recognize what is claimed. The appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement. One may consider examples from the chemical arts. A description of an anti-inflammatory steroid, *i.e.,* a steroid (a generic structural term) described even in terms of its function of lessening inflammation of tissues fails to distinguish any steroid from others having the same activity or function. Similarly, the expression an antibiotic penicillin fails to distinguish a particular penicillin molecule from others possessing the same activity. A description of what a material does, rather than of what it is, usually does not suffice. *Eli Lilly,* 119 F.3d at 1568, 43 USPQ2d at 1406. The disclosure must allow one skilled in the art to visualize or recognize the identity of the subject matter purportedly described. *Id.*

[15][16] In *Eli Lilly,* we were faced with a set of facts in which the words of the claim alone did not convey an adequate description of the invention. *Id.* at 1567, 119 F.3d 1559, 43 USPQ2d at 1405. In such a situation, regardless whether the claim appears in the original specification and is thus supported by the specification as of the filing date, § 112, ¶ 1 is not necessarily met. *See Guidelines* at 1100 (noting *Eli Lilly's* clarification of the "original claim" doctrine in situations in which the name of the claimed material does not convey sufficient identifying information). If a purported description of an invention does not meet the requirements of the statute, the fact that it appears as an original claim or in the specification does ***969** not save it. A claim does not become more descriptive by its repetition, or its longevity.

[17] Inasmuch as 112, 1 requires such description, we are not persuaded by Enzo's argument that, because the specification indicated that Enzo possessed the claimed invention by reducing three sequences within the scope of the claims to practice, Enzo necessarily described the invention. It is true that in *Vas-Cath,* we stated: "The purpose of the 'written description' requirement is broader than to merely explain how to 'make and use'; the applicant must also convey with reasonable clarity to those skilled in the art that, as of

the filing date sought, he or she was in possession of the invention." *Vas-Cath,* 935 F.2d at 1563-64, 19 USPQ2d at 1117. That portion of the opinion in *Vas-Cath,* however, merely states a *purpose* of the written description requirement, *viz.*, to ensure that the applicant had possession of the invention as of the desired filing date. It does not state that possession alone is always sufficient to meet that requirement. Furthermore, in *Lockwood v. American Airlines, Inc.*, we rejected Lockwood's argument that "all that is necessary to satisfy the description requirement is to show that one is 'in possession' of the invention." 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed.Cir.1997). Rather, we clarified that the written description requirement is satisfied by the patentee's disclosure of "such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention." *Id.*

[18][19][20] The articulation of the written description requirement in terms of "possession" is especially meaningful when a patentee is claiming entitlement to an earlier filing date under 35 U.S.C. § § 119 or 120, in interferences in which the issue is whether a count is supported by the specification of one or more of the parties, and in *ex parte* applications in which a claim at issue was filed subsequent to the application. *See Vas-Cath,* 935 F.2d at 1560, 19 USPQ2d at 1114 (describing situations in which the written description requirement may arise); *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed.Cir.1985) (noting, in the context of claiming entitlement to the priority date of an earlier application, that the written description requirement is met if "the disclosure of the application relied upon reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter"). Application of the written description requirement, however, is not subsumed by the "possession" inquiry. A showing of "possession" is ancillary to the *statutory* mandate that "[t]he specification shall contain a written description of the invention," and that requirement is not met if, despite a showing of possession, the specification does not adequately describe the claimed invention. After all, as indicated above, one can show possession of an invention by means of an affidavit or declaration during prosecution, as one does in an interference or when one files an affidavit under 37 C.F.R. § 1.131 to antedate a reference. However, such a showing of possession alone does not cure the lack of a written description in the specification, as required by statute.

[21][22] Similarly, we conclude that proof of a reduction to practice, absent an adequate description in the specification of what is reduced to practice, does not serve to describe or identify the invention for purposes of § 112, ¶ 1. As with "possession," proof of a reduction to practice may show priority of invention or allow one to antedate a reference, but it does not by itself provide a written description *in the patent specification.* We are thus not persuaded***970** by Enzo's argument, relying on the PTO's Guidelines, that its disclosure of an actual reduction to practice is an important "safe haven" by which it has demonstrated compliance with the description requirement. The Guidelines state:

Actual reduction to practice may be crucial in the relatively rare instances where the level of knowledge and level of skill are such that those of skill in the art cannot describe a composition structurally, or specify a process of making a composition by naming components and combining steps, in such a way as to distinguish the composition with particularity from all others.

Guidelines, 66 Fed. Reg. at 1101. For biological inventions, for which providing a description in written form is not practicable, one may nevertheless comply with the written description requirement by publicly depositing the biological material, as we have held today. That compliance is grounded on the fact of the deposit and the accession number in the specification, not because a reduction to practice has occurred. Such description is the *quid pro quo* of the patent system; the public must receive meaningful disclosure in exchange for being excluded from practicing the invention for a limited period of time.

CONCLUSION

For the foregoing reasons, we conclude that the district court erred in granting summary judgment that the claims of the 659 patent are invalid for failure to meet the written description requirement of 112, 1. While the district judge clearly understood and correctly applied this courts existing precedent, we nevertheless reverse because this case has taken us into new territory and we have held, as a matter of first impression, that reference in a patent specification to a deposit of genetic material may suffice to describe that material. We therefore remand for further resolution consistent with this opinion.

REVERSED and REMANDED

ORDER

July 15, 2002.

A petition for rehearing was filed by the plaintiff-appellant, and a response thereto was invited by the court and filed by the defendants-appellees. The United States Patent and Trademark Office and Fish & Richardson P.C. filed briefs as amici curiae. This matter was referred first to the merits panel that heard this appeal, which vacated its earlier decision and prepared a revised decision for issuance. Thereafter, at the request of a non-panel judge, an en banc poll was conducted concerning whether the appeal ought to be heard en banc. The poll failed. *Circuit Judges* RADER, GAJARSA, and LINN would have heard the appeal en banc.

Upon consideration thereof,

IT IS ORDERED THAT:

The petition for rehearing is granted as set forth in the panel opinion issued concurrently with this order.

LOURIE, Circuit Judge, with whom PAULINE NEWMAN, Circuit Judge, joins, filed an opinion concurring in the court's decision not to hear the case en banc.
PAULINE NEWMAN, Circuit Judge, filed an opinion concurring in that decision.
DYK, Circuit Judge, filed an opinion concurring in that decision.
RADER, Circuit Judge, with whom GAJARSA and LINN, Circuit Judges, join, filed an opinion dissenting from that decision.
*971 LINN, Circuit Judge, with whom RADER and GAJARSA, Circuit Judges, join, filed an opinion dissenting from that decision.

ON DENIAL OF PETITION FOR REHEARING EN BANC

LOURIE, Circuit Judge, with whom PAULINE NEWMAN, Circuit Judge, joins, concurring in the court's decision not to hear the case en banc.

I agree that the court correctly declined to hear this case *en banc.*

First, it is important to note that the earlier panel majority, in response to the petition for rehearing, has reversed its earlier decision. Taking the case *en banc* would therefore delay and hence frustrate the remand of the case solely for the purpose of revising written description law. That law is sound and does not need revision, at least as proposed by the dissents.

The dissenters believe that the written description requirement is simply a requirement for enablement. With all due respect, that is incorrect. The *complete* statutory provision is as follows:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. § 112, ¶ 1 (1994) (emphasis added). I read the statute so as to give effect to its language. The statute states that the invention must be described. That is basic patent law, the *quid pro quo* for the grant of a patent. Judge Rader notes that historically the written description requirement served a purpose when claims were not required. While that may be correct, when the statute began requiring claims, it was not amended to delete the requirement; note the comma between the description requirement and the enablement provision, and the "and" that follows the comma. Judge Rich, whom Judge Rader cites, was in fact one of the earliest interpreters of the statute as having separate enablement and written description requirements. *In re Ruschig,* 54 C.C.P.A. 1551, 379 F.2d 990, 995-996, 154 USPQ 118, 123 (C.C.P.A.1967); *Vas-Cath Inc. v. Mahurkar,* 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1117 (Fed.Cir.1991). The basic requirement to describe one's invention was recently emphasized as an independent patentability requirement by the Supreme Court in *Festo:* In addition, the patent application must *describe,* enable, and set forth the best mode of carrying out the invention. § 112 (1994 ed.). These latter requirements must be satisfied before issuance of the patent, for exclusive patent rights are given in exchange for *disclosing* the invention to the public. *See* Bonito Boats, 489 U.S. at 150-151 109 S.Ct. 971. *What is claimed by the patent application must be the same as what is disclosed in the specification; otherwise the patent should not issue.*

Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 122 S.Ct. 1831, 1840, 152 L.Ed.2d 944 (2002) (emphases added).

It is said that applying the written description requirement outside of the priority context was novel until several years ago. Maybe so, maybe not; certainly such a holding was not precluded by statute or precedent. New interpretations of old statutes in light of new fact situations occur all the time. I

believe these issues have arisen in recent years for the same reason that more doctrine of equivalents *972 issues are in the courts, *viz.*, because perceptions that patents are stronger tempt patent owners to try to assert their patents beyond the original intentions of the inventors and their attorney. That is why the issues are being raised and that is why we have to decide them. Claims are now being asserted to cover what was not reasonably described in the patent.

Moreover, the dissenters would limit the requirement, to the extent that they credit the written description portion of the statute as being a separate requirement at all, to priority issues. The statute does not say "a written description of the invention for purposes of policing priority." While it has arisen primarily in cases involving priority issues, Congress has not so limited the statute, and we have failed to so limit it as well. As for the lack of earlier cases on this issue, it regularly happens in adjudication that issues do not arise until counsel raise them, and, when that occurs, courts are then required to decide them. Even now, a written description issue should not arise unless a patentee seeks to have his claims interpreted to include subject matter that he has not adequately disclosed in his patent. Although it is true that the written description requirement has been applied rigorously in some recent cases, I do not believe that any of those cases were decided wrongly. The losing patents (or applications) involved did not adequately disclose what was claimed: a particular ratio of variables, *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1327, 56 USPQ2d 1481, 1487 (Fed.Cir.2000); a sofa with controls other than on the console, *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1480, 45 USPQ2d 1498, 1503-1504 (Fed.Cir.1998); a cup other than a conical cup, *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159-60, 47 USPQ2d 1829, 1833-34 (Fed.Cir.1998); human insulin cDNA, *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1567, 43 USPQ2d 1398, 1405 (Fed.Cir.1997); or beta-interferon, *Fiers v. Revel*, 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed.Cir.1993). Interpretation of written description as this court has done furthers the goal of the law to have claims commensurate in scope with what has been disclosed to the public.

I believe that the dissenters miss the point in seeing this case as involving an original claim or *in ipsis verbis* issue. There is no question that an original claim is part of the specification. That was the question answered in the affirmative by *In re Gardner*, 480 F.2d 879, 178 USPQ 149 (C.C.P.A.1973), in which the CCPA found compliance with the written description requirement over the objection of the PTO Commissioner, who argued that an original claim should not be considered part of the written description unless the specification was amended to contain the subject matter of the original claim. However, the question here is whether the disclosure, as an original claim, or in the specification,[FN*] adequately describes the invention. It is incorrect that the mere appearance of vague claim language in an original claim or as part of the specification necessarily satisfies the written description requirement or shows possession of a generic invention.

> FN* Enzo's claim 1 is actually not an original claim. It was amended to include language appearing in the original specification and it thus appears *in ipsis verbis* in the specification.

Not only are we not entitled to ignore the statutory written description requirement, but our court has not. Earlier cases also upheld a separate written description requirement, and the fact that they may have pertained to priority disputes does not vitiate their basic requirement to disclose one's invention. *973Section 112, paragraph 1, does not limit itself to priority disputes. I thus believe it is incorrect, as Judge Rader states, that our cases have limited the written description/new matter doctrine to priority protection. Opinions explain the decisions on the issues that come before them on the facts presented; those cases have not expressly limited the written description requirement to priority issues, and in fact they emphasize that the requirement arises in a "variety of situations." *In re Wright*, 866 F.2d 422, 424, 9 USPQ2d 1649, 1651 (Fed.Cir.1989). Any language seemingly appearing to limit the language to priority issues does so because it addresses a priority issue that was before it. Other broad language is not binding holding on different facts and raising different issues. Courts do not, or should not, purport to write treatises on the law, outlining all aspects of a statute that comes before them. They decide issues raised in light of the decision being reviewed.

Moreover, even if written description is related to and overlaps with "new matter," so what? One can fail to meet the requirements of the statute in more than one manner, and in any event the case cited as equating those two requirements in fact distinguishes §§ 112 and 132 as concerning: (1) claims not supported by the disclosure; and (2) the prohibition of new matter to the disclosure, respectively. *In re Rasmussen*, 650

F.2d 1212, 1214-15, 211 USPQ 323, 326 (C.C.P.A.1981). *Rasmussen* states that "[t]he proper basis for rejection of a claim amended to recite elements thought to be without support in the original disclosure, therefore, is § 112, first paragraph, not § 132." *Id.*

In addition, we do not "elevate 'possession' to the posture of a statutory test of patentability." Rather, the opinion refines the "possession" test for circumstances such as these in which the inventors showed possession of a species of the invention by reference to a deposit, but may not have described what else within the scope of the claims they had possession of. While "possession" is a relevant factor in determining whether an invention is described, it is only a criterion for satisfying the statutory written description requirement. Showing possession is not necessarily equivalent to providing a written description.

Judge Rader's dissenting opinion cites authors who disapprove of our decisions. While views of knowledgeable and objective commentators are surely of interest to this court, we should not interpret the law based on taking polls of discontented writers. Our commission is to apply the law to the facts and attempt to explain the reasons for our decisions. Critical articles may be written by those who have lost a case, or those who are skilled in a particular technology or not, or those who have little practical experience or who are seasoned experts. While Judge Rader cites articles critical of *Lilly,* others are favorable. Not surprisingly, an author from Eli Lilly took a positive view of the case. *See* Mark J. Stewart (patent associate at Eli Lilly), Note, *The Written Description Requirement of 35 U.S.C. § 112(1): The Standard After Regents of the University of California v. Eli Lilly & Co.,* 32 Ind. L.Rev. 537, 563 (1999) ("[T]he holding in *Lilly* actually avoided a disaster that would have crippled the biotechnology industry. The enormous amount of time and money companies spend to study DNA and protein variants, to clone homologous genes and protein family members, and to mine databases would no longer be justified had the court found the written description in 525 adequate.").

Other authors support a robust written description requirement and point out the benefits of such a requirement to the public.***974** *See, e.g.,* Scott A. Chambers, *"Written Description" and Patent Examination Under the U.S. Patent and Trademark Office Guidelines,* IP Litigator, Sept.-Oct.2000, at 9, 10 ("Thus, the Federal Circuit's present interpretation of the written description requirement maintains the vitality of the U.S. patent system and provides disclosures that others can build on. By suggesting that disclosure of the structure or actual sequence of complex chemical entities may sometimes be required, the Federal Circuit may have advanced the goal of the patent system to actually put the claimed invention into the hands of the public."); Margaret Sampson, *The Evolution of the Enablement and Written Description Requirements under 35 U.S.C. § 112 in the Area of Biotechnology,* 15 Berkeley Tech. L.J. 1233, 1260-61 (2000) ("Without a heightened written description requirement, inventors could receive patent rights to sequences of which they have no knowledge, in organisms with which they have never worked.... Therefore, the Federal Circuit's approach to the written description requirement in the area of biotechnology has prevented nucleotide sequence claims from becoming a Pandora's box that the patent law is unable to control."). In any event, we decide cases as they come to us, based on the arguments raised, the decisions below, the law, the facts, and our best efforts, not based on occasional journal articles.

Since some of the cases implicated by this issue are in the biotech field, I should point out that, among the problems in comprehension of the issues in a biotech context is that a functional description of DNA does not indicate which DNA has been invented. And simply acknowledging the presence of a DNA that serves a particular function, whose existence has been postulated since, perhaps, Mendel, plus a general process for finding it, is not a description of the DNA. It is a research plan at best, and does not show "possession" of any invention.

Still, in terms of the more practical aspects of complying with the statute, meeting the description requirement is the first task in drafting a patent application. Enabling one of skill in the art to make and use the invention is a separate requirement. To interpret the written description requirement only as an enablement provision is to let the tail wag the dog. Perhaps there is little difference in electrical and mechanical inventions between describing an invention and enabling one to make and use it, but that is not true of chemical and chemical-like inventions.

Enzo's patent claimed a genus of chemical-like materials (a sequence of nucleic acids is of a chemical nature-note the claims begin with "a composition"). Although one may envision a general concept, what one usually does first in making or isolating a chemical or chemical-related invention is to obtain a specific material or materials. One then broadens the concept to extend it as far as one envisions that other

materials will have the same utility and can be similarly made. That broadened concept becomes the genus in a patent application that is both the broadest statement constituting a written description and usually claim 1. One then elaborates to fill in the genus with representative examples of compounds or substances that fall within the genus. That is part of the written description needed to support the generic claim. *Then,* one tells how to make the materials, and then how to use them. That is enablement, separate in concept from describing *what* the invention is. The idea that there is no requirement in the statute to describe one's new invention (aside from the fact that the language of the statute contains one) separate from the requirement to enable one to make and use it is not correct. Disclosure ***975** is the first role of a patent. One must first state what one's invention is. That is quite different from telling how to make and use it.

Some commentators have had difficulty in understanding how one may have enabled an invention, but not described it. They believe they must coincide. As an example of how the written description and enablement provisions differ in chemistry, however, one may readily have enabled the making of an invention, but still not have described it. For example, a propyl or butyl compound may be made by a process analogous to a disclosed methyl compound, but, in the absence of a statement that the propyl and butyl compounds are part of the invention, they have not been described and they are not entitled to a patent (I make no implication here about coverage under the doctrine of equivalents). *See* In re DiLeone, 58 C.C.P.A. 925, 436 F.2d 1404, 1405 n. 1, 168 USPQ 592, 593 n. 1 (1971) ("[C]onsider the case where the specification discusses only compound A and contains no broadening language of any kind. This might very well enable one skilled in the art to make and use compounds B and C; yet the class consisting of A, B and C has not been described."). This is surely part of the recent history of some biotechnology patents.

In sum, we have evolved a consistent body of law over a number of years, based on the statute and basic principles of patent law. I see no reason to hear this case *en banc* and rewrite the statute.

PAULINE NEWMAN, Circuit Judge, concurring in the denial of rehearing en banc.

I join Judge Lourie's statement, and write separately to emphasize my concern with the position of the dissent concerning the law of written description. The description of the invention has always been the foundation of the patent specification. It sets forth what has been invented, and sets boundaries of what can be claimed. The theory of the dissent that a description of the invention is not needed in order to support the claims, but serves only to antedate prior art or establish priority in an interference, is a dramatic innovation in the theory and practice of patents. It has never been the sole purpose of the description requirement, and negates not only the logic but also the history of patent practice. The dissent's citation of cases in which the description of the invention has been relied on to antedate references and in interference contests reinforces, not reduces, the role of the description of the invention in establishing what has been invented.

The dissent argues that the subject matter that is intended to be patented need not be described, as long as it is enabled. Undoubtedly, in many patents these requirements are met by the same information content. And the special case of the biological deposit is a method of complying with the statutory requirements, as the panel now confirms; this expedient implements the statute for this special subject matter, but does not change it. It is not the law that the description of the invention serves only to establish priority, to be invoked only when priority is at issue. The invention that is covered by the claims must be described as well as enabled, as the statute has always required.

DYK, Circuit Judge, concurring in the court's decision not to hear the case en banc.

The opinions of Judges Newman, Lourie, Rader, and Linn concerning the denial of *en banc* rehearing raise important and interesting questions, including questions concerning the correctness of our earlier ***976** decision in Regents of the University of California v. Eli Lilly & Co., 119 F.3d 1559, 43 USPQ2d 1398 (Fed.Cir.1997), *cert. denied,* 523 U.S. 1089, 118 S.Ct. 1548, 140 L.Ed.2d 695 (1998), that may someday warrant the court's *en banc* attention. Given the panel's decision on rehearing, remanding for further consideration by the district court, this is not the appropriate occasion for *en banc* review. The court will also benefit from further percolation of these issues before they are addressed by the full court.

RADER, Circuit Judge, with whom GAJARSA and LINN, Circuit Judges, join, dissenting from the court's decision not to hear the case en banc.

The tortuous path of this case shows the perils of ignoring the statute and over thirty years of consistent written description case law [FN1]. The first version of this opinion, Enzo Biochem, Inc. v. Gen-Probe, Inc., 285 F.3d 1013, 62 USPQ2d 1289 (Fed.Cir.2002), purported to invalidate a patent because the inventor had not shown "possession of the invention" for written description. *See,* Vas-Cath Inc. v. Mahurkar,

935 F.2d 1555, 1564, 19 USPQ2d 1111, 1117 (Fed.Cir.1991). As this court now acknowledges, an inventor can hardly show possession of an invention better than by depositing the invention in an internationally recognized repository. This court corrects part of the mistake of *Enzo I.* Yet the court still remands to the district court to reexamine the written description requirement. Because the written description requirement as created and applied for thirty years does not apply to this case, I would grant *en banc* review and correct the rest of this court's misapplication of the description requirement.

FN1. An appendix at the close of this opinion will briefly explicate all written description cases from its creation in 1967 in the Court of Customs and Patent Appeals to the present. This appendix shows that only two cases, this ENZO case and the 1997 LILLY case have purported to apply the doctrine outside its purpose and function.

Statute

Because the greater mistake in this case is misapplication of this court's written description case law, this opinion devotes only a few paragraphs to the statutory interpretation question. The United States' brief as *amicus curiae* in support of rehearing *en banc* states concisely this *Enzo* opinion's disregard for the statute:

A straightforward reading of the text of section 112 suggests that the test for an adequate written description is whether it provides enough written information for others to make and use the invention. The statute provides that the "specification shall contain a written description of the invention ... in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same." 35 U.S.C. § 112 ¶ 1. Thus, an adequate written description assures that others can "make and use" the invention.[FN2]

FN2. This court rejected the "straightforward reading" of the statute in *Vas-Cath* because the written description (WD) doctrine was a priority control, not the general disclosure doctrine of enablement. *See,* Vas-Cath, 935 F.2d 1555. Within the proper purpose of WD, *Vas-Cath* makes sense. When applied outside the priority context as a general disclosure doctrine, however, WD cannot depart from the enablement test without replacing it. Thus, the United States advocates application of the statutory standard of enablement.

If it is possible to characterize disregard of statutory text as a secondary mistake, this case fits that classification. The more important problem is disregard for the case law that originated the written description requirement and applied it for over thirty years.

*977 *Origin and History of the Written Description Requirement*

The words "written description" first appeared in the Patent Act of 1793. At that time, of course, patents did not require claims but only a written description sufficient "to distinguish [the invention] from all other things before known or used." In Evans v. Eaton, 20 U.S. (7 Wheat.) 356, 5 L.Ed. 472 (1822), the Supreme Court construed the description language to require applicants to enable their inventions and to provide the notice function of claims:

[After enablement,] [t]he other object of the specification is to put the public in possession of what the party claims as his own invention, so as to ascertain if he claims any thing that is in common use, or is already known ...

Id. at 433. In later enactments, this notice function was assigned to claims, leaving enablement as the only purpose of the "written description" language. As noted in the United States' brief, the modern descendant of the 1793 phrase still requires only a written description "in such ... terms as to enable [the invention]." 35 U.S.C. § 112. In *J.E.M. AG Supply,* the Supreme Court acknowledged only enablement as the disclosure *quid pro quo* of the Patent Act: "In addition [to novelty, utility, and nonobviousness], to obtain a utility patent, a breeder must describe the plant with sufficient specificity to enable others to 'make and use' the invention after the patent term expires." *J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 122 S.Ct. 593, 604, 151 L.Ed.2d 508 (2001). Reading the statute, the Supreme Court correctly found no general disclosure requirement in title 35 other than enablement.[FN3]

FN3. In *Festo,* the Supreme Court mentions a description requirement separate from enablement. *Festo Corp. v. Shoketsu Kogyo Kabushiki Co.*, 535 U.S. 722, 122 S.Ct. 1831,

1840, 152 L.Ed.2d 944 (2002). This listing of doctrines, however, did not endorse any departure from this court's case law for more than thirty years.

Before 1967, this court's predecessor, the United States Court of Customs and Patent Appeals also did not differentiate written description from enablement. In 1966, that predecessor court wrote in detail about section 112, paragraph 1, and found only two requirements-enablement (the A requirement under Judge Rich's terminology) and best mode (the B requirement). *In re Gay*, 50 C.C.P.A. 725, 309 F.2d 769, 772, 135 USPQ 311, 315 (1962).

In 1967, the Court of Customs and Patent Appeals first separated a new written description (WD) requirement from the enablement requirement of § 112. The reason for this new judge-made doctrine needs some explanation. Every patent system must have some provision to prevent applicants from using the amendment process to update their disclosures (claims or specifications) during their pendency before the patent office. Otherwise applicants could add new matter to their disclosures and date them back to their original filing date, thus defeating an accurate accounting of the priority of invention. Priority always a vital issue in patent prosecution procedures-often determines entitlement to an invention. Before 1967, the United States Patent Office and the Court of Customs and Patent Appeals used a "new matter" rejection to ensure that applicants did not update their disclosures after the original filing date of the application. This "new matter" rejection had a statutory basis: "No amendment shall introduce new matter into the disclosure of the invention." 35 U.S.C. § 132.

In 1967, in *In re Ruschig*, 54 C.C.P.A. 1551, 379 F.2d 990, 154 USPQ 118 (1967), this court's predecessor created for the ***978** first time a new WD doctrine to enforce priority. In the context of a new claim added "[a]bout a year after the present application was filed," the *Ruschig* court sought to determine "whether [the new] claim 13 is supported by the disclosure of appellants' application." *Id.* at 991. Rather than use § 132, however, *Ruschig* assigned the role of policing priority to § 112. As a technical matter, the Court of Customs and Patent Appeals distinguished between adding new matter to the specification and adding new matter to the claims. Under PTO practice, new matter in the claims would draw a § 132 *rejection* of the claims; new matter in the specification would draw a § 132 *objection* to the addition. The *Ruschig* court, for the first time, decided to treat the objection alone as a § 132 matter. To deal with new matter in the claims, the court calved a new WD doctrine out of the § 112 enablement requirement [FN4]. As long as the new WD doctrine applied according to its original purpose as an identical twin of the § 132 new matter doctrine, these technical distinctions were of little practical consequence.

FN4. As a matter of integrity to the statute, the *Ruschig* distinction has a major problem, namely the language of § 132 embraces both new matter rejections of amended claims and new matter objections to amended specifications. Both claims and the rest of the specification are part of the patent "disclosure" within the terms of § 132. *See, e.g., In re Frey*, 35 C.C.P.A. 970, 166 F.2d 572, 575, 77 USPQ 116, 119 (1948) ("Certainly the [claim] is a disclosure of itself."). Moreover implicit in the judicial creation of a new WD requirement is the incorrect assumption that the Patent Act had no remedy for new matter in claims before 1967. In fact, § 132 embraces both new matter rejections and objections.

In any event, the WD doctrine, at its inception had a very clear function preventing new matter from creeping into claim amendments. Judge Rich, the author of *Ruschig*, often reiterated the purpose of WD. For instance in the case of *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the Court of Customs and Patent Appeals confronted a priority issue:

The dispositive issue under this heading is whether appellants' parent and Swiss applications comply with 35 U.S.C. § 112, first paragraph, including the description requirement, as to the subject matter of these claims. If they do, these claims are entitled to the filing dates of the *parent* application.... [A] right of foreign *priority* in appellants' Swiss application will antedate Pfluger 1966 and remove it as prior art against the claims.

Id. at 261 (emphasis added). In resolving this question, Judge Rich stated again the purpose of WD: "The function of the description requirement is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter *later* claimed by him." *Id.* at 262 (emphasis added). In sum, WD was a new matter doctrine, a priority policeman.

Returning to the history of WD, after 1967, the PTO

continued to use new matter rejections under § 132, but also embraced the coterminous written description analysis. Thus, for many years, the PTO rejected priority errors in claims under both § 132 and § 112.

In 1981, the Court of Customs and Patent Appeals noted that the two rejections were interchangeable: "This court, ha[s] said that a rejection of an amended claim under § 132 is *equivalent to* a rejection under § 112, first paragraph." *In re Rasmussen*, 650 F.2d 1212, 1214, 211 USPQ 323, 325 (CCPA, 1981) (emphasis added). To avoid confusion between new matter rejections and objections, the court chose to eliminate the § 132/§ 112 rejections and to use § 112 for new matter rejections (claims): "The proper basis for rejection of a claim amended to recite elements ***979** thought to be without support in the original disclosure, therefore, is § 112, first paragraph, not § 132." *Id.* The purpose of the doctrine did not change. As the sentence above states explicitly, the § 112 doctrine, like its corollary § 132, policed priority, nothing more. At no time did either the CCPA or the Federal Circuit purport to apply the equivalent new matter/written description rejections to original claims or other claims without priority problems. *See, e.g., In re Koller*, 613 F.2d 819, 823, 204 USPQ 702, 706 (CCPA 1980) ("[O]riginal claims constitute their own description."); *In re Gardner*, 475 F.2d 1389, 1391, 177 USPQ 396, 397 (CCPA 1973) ("Claim 2, which apparently was an original claim, in itself constituted a description in the original disclosure.... Nothing more is necessary for compliance with the description requirement...."). WD, the equivalent of the statutory new matter doctrine, simply has no application to claims without priority problems.

The Federal Circuit continued to follow this binding precedent. *See, e.g., Vas-Cath*, 935 F.2d at 1560 ("The question raised by these situations is most often phrased as whether the application provides 'adequate support' for the claim(s) at issue; it has also been analyzed in terms of 'new matter' under 35 U.S.C. § 132."); *In re Wright*, 866 F.2d 422, 424, 9 USPQ2d 1649, 1651 (Fed.Cir.1989) ("When the scope of a claim has been changed by amendment in such a way as to justify an assertion that it is directed to a *different invention* than was the original claim, it is proper to inquire whether the newly claimed subject matter was *described* in the patent application when filed as the invention of the applicant. That is the essence of the so-called 'description requirement' of § 112, first paragraph.") (emphases added);[FN5] *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed.Cir.1983). In fact, this Circuit's test for written description required assessment of the specification to check "later claimed subject matter." *Id.* at 1375 ("The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the *later* claimed subject matter, *rather than the presence or absence of literal support in the specification for the claim language.*") (emphasis added). In fact, this standard emphasizes that WD does not examine the specification for "literal support" of the claim language unless priority is in question. In any event, this Circuit did not apply WD to claims without priority problems because the doctrine had no purpose beyond policing priority.[FN6]

FN5. In *Wright*, Judge Rich mentions that WD arises in "a variety of situations." *Id.* Of course, this observation is an accurate description of the priority issue. Priority arises in the context of a § 102(b) rejection, *see, e.g., In re Ruschig*, 379 F.2d at 991, a § 119 issue, *see, e.g., In re Wertheim*, 541 F.2d at 261, a § 120 issue, *see, e.g., Kennecott Corp. v. Kyocera Int'l., Inc.*, 835 F.2d 1419, 1421 (Fed.Cir.1987) ("The incorporation of the requirements of section 112 into section 120 ensures that the inventor had possession of the later-claimed invention on the filing date of the earlier application."), and a § 102(g) interference, *see, e.g., Fiers v. Revel*, 984 F.2d at 1169, to mention just a few of the variety of situations in which priority arises. This statement hardly justifies applying WD outside its purpose as a test for sufficiency of disclosure.

FN6. Again, the appendix at the close of this opinion shows that the Federal Circuit uniformly applies WD to police priority. Only the LILLY and this ENZO opinion purport to apply it as a general disclosure requirement in place of enablement.

The deviation from thirty years of precedent

In 1997, for the first time, this court purported to apply WD as a general disclosure***980** doctrine in place of enablement, rather than as a priority doctrine. *Regents of the Univ. of Cal. v. Eli Lilly and Co.*, 119 F.3d 1559, 43 USPQ2d 1398 (Fed.Cir.1997). In *Lilly*, this court found that the 525 patent specification does not provide a WD of human insulin cDNA despite the disclosure of a general method of producing human insulin cDNA and a description of the human insulin

A and B chain amino acid sequences that cDNA encodes. 119 F.3d at 1567. In the words of the court, "a description that does not render a claimed invention obvious does not sufficiently describe that invention for purposes of § 112, ¶ 1." *Id.* At another point, the court stated: "An adequate written description of a DNA ... 'requires a precise definition, such as by structure, formula, chemical name, or physical properties ....' " *Id.* at 1566 (quoting *Fiers v. Revel*, 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed.Cir.1993)). In sum, the *Lilly* opinion does not test a later claim amendment against the specification for priority, but asserts a new free-standing disclosure requirement in place of the statutory standard of enablement. Based on the absence of a nucleotide-by-nucleotide recitation in the specification of the human insulin cDNA, the court determined that the applicant had not adequately described the invention. For the first time, this court purported to apply WD without any priority question. *But see, Kaslow*, 707 F.2d at 1375 ("rather than the presence or absence of literal support in the specification for the claim language."). Even accepting that WD can be isolated as a separate requirement from enablement in § 112, ¶ 1, the words "written description" hardly prescribe a standard that requires nucleotide-by-nucleotide disclosure.

Under the correct written description test, one of skill in the art would have recognized that the 525 patent in *Lilly* had no new matter or priority problems. In terms of the statutory test for adequacy of disclosure, the patent disclosure undoubtedly warranted rejection for lack of enablement. Under the *In re Wands* test for enablement, 858 F.2d 731, 8 USPQ2d 1400 (Fed.Cir.1988), the inventor certainly did not show one of skill in the art how to make human insulin cDNA.[FN7] Moreover the patent claimed vertebrate insulin cDNA a category ranging from fish to humans again claims whose scope far exceeds the patent's enabling disclosures. In fact, the patent disclosure only revealed that the inventor had enabled cloning of rat insulin. Instead of invalidating under the statutory test for adequacy of disclosure, i.e., enablement, the *Lilly* court purported to create a new doctrine for adequacy of disclosure that it labeled incorrectly "written description." As noted, from its creation through thirty years of application, WD had never been a free-standing substitute for enablement.

> FN7. U.S. Pat. No. 4,652,525, the patent at issue in *Lilly*, was filed in 1983, but claimed priority to a parent filed in 1977. In 1977, biotechnology was still in its infancy. In fact, the Maxam and Gilbert method of sequencing DNA was just published in 1977. Cloning in that era was, at a minimum, unpredictable and would have required vast amounts of experimentation to accomplish. Therefore, the patent's prophetic disclosure of human insulin cDNA hardly enabled its production as claimed. Instead of pursuing this obvious avenue of rejection, the Federal Circuit reached out beyond the statute and the case law to create a new general disclosure test.

Although it should not be necessary, a brief defense of the statutory standard for adequate disclosure shows the flaws of the new form of WD. Enablement already requires inventors to disclose how to *make* (reproduce, replicate, manufacture) and how to *use* the invention (by definition rendering it a "useful art"). Therefore, ***981** because the competitor can make the invention, it can then acquire the DNA sequence or any other characteristic whenever it desires. Meantime the competitor can use, exploit, commercialize (outside the patent term) or improve upon and design around (within the patent term) as much of the invention as it cares to make. In other words, the statutory standard for sufficiency of disclosure serves masterfully the values of the patent system.

Even after *Lilly*, the Federal Circuit-in all other WD cases before this *Enzo* case-applied priority principles, declining to assert the doctrine as a general test for adequacy of disclosure. *See, e.g., Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 54 USPQ2d 1227 (Fed.Cir.2000). One of those opinions analyzes WD with particular care:

The written description requirement and its corollary, the new matter prohibition of 35 U.S.C. § 132, both serve to ensure that the patent applicant was in full possession of the claimed subject matter on the application filing date. When the applicant adds a claim or otherwise amends his specification after the original filing date, as Brandon did in this case, the new claims or other added material must find support in the original specification.

TurboCare Div. Of Demag Delaval Turbomachinery Corp. v. General Elec. Co., 264 F.3d 1111, 1118, 60 USPQ2d 1017, 1022 (Fed.Cir.2001).

In sum, the written description language has been in the statute since 1870, yet only since 1967 has case law separated it from enablement. The separation itself is not disruptive of the patent system, however, because the doctrine operated solely to police priority.

Indeed, with the exception of *Lilly* and this *Enzo* case, this court and its predecessor have only applied the doctrine within the limits of its origin as an "equivalent" or "corollary" of 35 U.S.C. § 132, the new matter section.

Enzo and written description

The record in this case shows that no priority issues remain to invoke WD. The inventor in this case amended the original claims in response to the examiner's request to place the selective hybridization steps in the claims. Thus, the amendments were all narrowing meaning the applicant added no new matter to the claims by amendment. Instead, the applicant copied material from the original specification into the original claims. By definition, this case presents no new matter or priority issues requiring application of the original WD doctrine. The original specification contained all of the subject matter included in the inventor's claims. For this reason, the panel misapplies § 112, ¶ 1 by remanding on the question of WD. *See,* slip op. at 17 ("On remand, the court should consider whether one of skill in the art would find the generically claimed sequences described on the basis of Enzo's disclosure of the hybridization function and an accessible structure, consistent with the PTO Guidelines. If so, the written description requirement would be met."). If any § 112, ¶ 1 questions remain, they are questions of the sufficiency of disclosure, an enablement question. Instead, the panel, relying on *Lilly,* advocates applying WD "regardless whether the claim appears in the original specification and is thus supported by the specification as of the filing date." *Id.* at 18. To the contrary, WD has no such application consistent with the statute and the case law.

Why does this matter?

As both *Lilly* and this case show, the aberrant form of WD requires far more ***982** specific disclosure than enablement.[FN8] Because the *Lilly* application of § 112, ¶ 1 requires a far more demanding disclosure, defendants will have no need to invoke enablement, but will proceed directly to the more demanding *Lilly* § 112, ¶ 1 requirements. Thus, the new breed of WD evident in *Lilly* and this case threatens to further disrupt the patent system by replacing enablement the statutory test for adequate disclosure. *See,* Rai, Arti, "Intellectual Property Rights in Biotechnology: Addressing New Technology" 34 *Wake Forest L.Rev.* 827, 834-35 (Fall, 1999) ("Thus in [*Lilly*] ... the CAFC broke new ground by applying the written description requirement not only to later-filed claims but also to claims filed in the original patent.... [T]he *Lilly* court used the written description requirement as a type of elevated enablement requirement."); Mueller, Janice M., "The Evolving Application of the Written Description Requirement to Biotechnological Inventions" 13 *Berkeley Tech. L.J.* 615, 617 (Spring 1998) ("The *Lilly* decision establishes uniquely rigorous rules for the description of biotechnological subject matter that significantly contort written description doctrine away from its historic origins and policy grounding. The *Lilly* court elevate[s] written description to an effective 'super enablement' standard....").

> FN8. "Conflicts in Federal Circuit Patent Law Decisions," *The Federal Circuit Bar Journal,* Vol. 11, no. 3, p. 723, chronicles this circuit's primary conflicts. Listed first as the leading conflict is "I. The Written Description Requirement of § 112, First Paragraph." *Id.* at 725-34. The article notes: "[T]he Federal Circuit has not provided clear and consistent rules for determining precisely what type of disclosure is sufficient to comply with the § 112 written description requirement." *Id.* at 725. The article then notes three separate tests for measuring compliance with § 112, ¶ 1. For instance, "[t]he strictest approach requires the written description to delineate all of the claimed elements." *Id.*

Furthermore, the Supreme Court repeatedly cautioned against the disruption of the settled expectations of the inventing community. *Festo,* 122 S.Ct. at 1841 ("The responsibility for changing [settled law] rests with Congress.... Fundamental alterations in these rules risk destroying the legitimate expectations of inventors in their property."). *Lilly* and now this case change the application of the WD test and "up the ante" for disclosure a situation inventors might have addressed if they could have foreseen that this court would disrupt settled disclosure principles. At this point, however, those inventors have no way to change patents that comply with enablement disclosure, but not the stiffer demands of *Lilly.*

Replacement of enablement doctrines with an ill-defined general disclosure doctrine of WD imperils the integrity of the patent system. Enablement, arguably the most important patent doctrine after obviousness, has many important applications.

Beyond mere adequacy of disclosure, it serves as the line of demarcation between the visionary theorist (adds nothing to the useful arts) and the visionary pioneer (contributes to the useful arts), *see, e.g.,* Gould v. Hellwarth, 472 F.2d 1383, 176 USPQ 515 (CCPA 1973), and also serves to limit claim scope thus demarking the boundary between pioneer inventions and patentable improvements, *see, e.g., In re Wright,* 999 F.2d 1557 (Fed.Cir.1993). The WD possession test cannot perform these functions. Professor Janis explains that WD provides a blunt tool to measure the sufficiency of disclosure:

Today, however the written description requirement enjoys a prominence wholly out of proportion to its humble origins.

....

***983** Recent efforts to elaborate the 'possession' standard both confirm the substantial redundancy of the enablement and written description requirements ....

....

[T]he written description requirement is a threat to the coherence of disclosure doctrines....

Janis, Mark D., "On Courts Herding Cats: Contending with the 'Written Description' Requirement (and Other Unruly Patent Disclosure Doctrines)" 2 *Wash. U.J.L. & Pol'y* 55, 60, 70, 83 (2000).

Professors Rai, Mueller, and Wegner, among others, agree with Professor Janis's assessment. Rai, Mueller, *supra;* Wegner, Harold C., "An Enzo White Paper: A New Judicial Standard for a Biotechnology 'Written Description' Under 35 U.S.C. § 112, ¶ 1" 1 *J. Marshall Rev. Intell. Prop. L.* 254, 263 (2002) (recognizing "there may very well be problems with the scope of enablement in the facts of the *Enzo* case," but written description would not apply to "original claims.").

For biotech inventions, according to the *Lilly* standard, § 112, ¶ 1 requires a precise listing of the DNA sequence nucleotide-by-nucleotide. Enablement, on the other hand, requires that the specification show one of skill in the art how to acquire that sequence on their own. As a test for biotech claims without priority issues, WD may well jeopardize a sizeable percentage of claims filed before the *Lilly* departure in 1997. These patents had no notice of a change in the statutory standard for disclosure. Moreover the *Lilly/Enzo* rule prejudices university or small inventors who do not have the expensive and time-consuming resources to process every new biotechnological invention to extract its nucleotide sequence. *See,* Mueller, *supra* at 617 ("*Lilly* ... will likely chill development."); Sampson, Margaret, "The Evolution of the Enablement and Written Description Requirements Under 35 U.S.C. § 112 in the Area of Biotechnology." *15 Berkeley Tech. L.J.* 1233, 1262 (Fall 2000) ("The primary argument against the Federal Circuit's heightened written description requirement for biotechnological invention is that ... it also 'reduces incentives to invest in innovation by depriving potential patentees of the opportunity to fully benefit from their research.' ").

Saving the obvious for last, *Lilly* and this case really cannot depart from decades of established case law on § 112, ¶ 1. Even the court's decision to issue this improved version of *Enzo* without correcting all the problems does not indicate any acceptance of written description as a general disclosure doctrine for all claims regardless of priority issues. *Lilly* and this case are panel cases and cannot override the statute that makes enablement the general disclosure doctrine and the vast body of prior case law limiting WD to its original purpose. Sadly, however, this case will perpetuate the confusion.

Conclusion

Written description a part of the Patent Act since 1870 has taken on a life separate from its statutory context only since 1967. As long as WD applied only for the reasons that occasioned its judicial creation, it did not disrupt the rest of the Patent Act. Two recent cases, however, this case and the 1997 *Lilly* case, have purported to create a new disclosure doctrine that supplants enablement. Although this court declines to take this occasion to correct those dalliances, the origin and purpose of both § 112, ¶ 1 doctrines serve notice that neither *Lilly* nor this case properly applies the otherwise orderly disclosure doctrines.

***984** APPENDIX

CCPA

1. *In re Ruschig,* 54 C.C.P.A. 1551, 379 F.2d 990 (1967). "These claims were under rejection by reason of one-year statutory bars which could be overcome only by reliance on the filing date of the present *parent* application which gave rise to the question whether the application contained support for the claims." *Id.* at 991.

I. In re Ahlbrecht, 58 C.C.P.A. 848, 435 F.2d 908 (1971). "[T]he parties disagree as to whether the

disclosure in the *earlier* application is sufficient under the first paragraph of 35 U.S.C. § 112 to support the invention claimed in claim 7." *Id.* at 909.

3. *Fields v. Conover*, 58 C.C.P.A. 1366, 443 F.2d 1386 (1971). "[E]ven when considered ... it falls far short ... of the 'full, clear, concise, and exact' written description which we have said is necessary to support *subsequently* added claims." *Id.* at 1392.

4. *In re Smith*, 59 C.C.P.A. 1025, 458 F.2d 1389 (1972). "[A]ppellant has no basis on which the disclosure in the 1947 application may be treated as a description of the subject matter *now* claimed." *Id.* at 1394.

5. *In re Gardner*, 475 F.2d 1389 (CCPA 1973). "Claim 2, which apparently was an original claim, in itself constituted a description in the original disclosure equivalent in scope and identical in language to the total subject matter now being claimed." *Id.* at 1391.

6. *In re Smith*, 481 F.2d 910 (CCPA 1973). "Satisfaction of the description requirement insures that subject matter presented in the form of a claim *subsequent* to the filing date of the application was sufficiently disclosed at the time of filing so that prima facie date of invention can fairly be held to be the filing date of the application.... The specification as originally filed must convey clearly to those skilled in the art the information that the applicant has invented the specific subject matter *later* claimed." *Id.* at 914.

7. *In re Mott*, 539 F.2d 1291 (CCPA 1976). "The issue under this heading is whether appellant's specification, construed in light of the knowledge of those skilled in this art, contains a written description of the subject matter of claims 42, 44, and 46." (Claims 42, 44 and 46 were claims copied from the Taylor patent and put in the application by *amendment*.) *Id.* at 1296.

8. *In re Wertheim*, 541 F.2d 257 (CCPA 1976). "The dispositive issue under this heading is whether appellants' parent and Swiss applications comply with 35 U.S.C. § 112, first paragraph, including the description requirement, as to the subject matter of these claims. If they do, these claims are entitled to the filing dates of the *parent* application .... [A] right of foreign *priority* in appellants' Swiss application will antedate Pfluger 1966 and remove it as prior art against the claims." *Id.* at 261. "The function of the description requirement is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter *later* claimed by him." *Id.* at 262.

9. *In re Blaser*, 556 F.2d 534 (CCPA 1977). "The function of the description requirement is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter *later* claimed by him." *Id.* at 537 (quoting *In re Wertheim*, 541 F.2d at 262).

10. *In re Barker*, 559 F.2d 588 (CCPA 1977). "We can find no indication in the specification or claims as originally filed that appellants invented the subject matter *now* claimed." *Id.* at 593.

***985** 11. *In re Driscoll*, 562 F.2d 1245 (CCPA 1977). "Appellant does not dispute that the appealed claim is anticipated by the Belgian patent if the present application is not entitled to the *earlier* filing date of S.N. 782,756. Consequently, the sole issue with respect to this aspect of the appeal is whether the disclosure of S.N. 782,756 described the subject matter of claim 13. In resolving this issue, we must view the disclosure of the *earlier* filed application as would a person skilled in the art and determine whether it reasonably conveys the information that as of the filing date thereof appellant had possession of the class of 5-alkylsulfonyl-1, 3, 4-thiadiazole ureas defined in claim 13." *Id.* at 1248-49.

12. *In re Edwards*, 568 F.2d 1349 (CCPA 1978). "The dispositive issue is whether appellants' *parent* application, serial No. 682,560, filed November 13, 1967, complies with the written description requirement of 35 U.S.C. § 112, first paragraph, vis-à-vis the subject matter of the appealed claim; if it does, then the claim is entitled to the filing date of the *parent* application under 35 U.S.C. § 120." *Id.* at 1351.

13. *In re Herschler*, 591 F.2d 693 (CCPA 1979). "[A]ppellant concedes that the substance of this rejection is proper if the court finds either the *great-grandparent* application lacks a written description of the *instant* invention." *Id.* at 699.

14. *In re Rasmussen*, 650 F.2d 1212 (CCPA 1981). "The proper basis for rejection of a claim amended to recite elements thought to be without support in the original disclosure, therefore, is § 112, first paragraph, not § 132. The latter section prohibits addition of new matter to the original disclosure. It is properly employed as a basis for objection to amendments to the abstract, specifications, or drawings attempting to add new disclosure to that originally presented." *Id.* at 1214-15.

Federal Circuit

1. *In re Kaslow*, 707 F.2d 1366 (Fed.Cir.1983). "The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the *later* claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language." *Id.* at 1375.

2. *Ralston Purina Co. v. Far-Mar-Co.*, 772 F.2d 1570 (Fed.Cir.1985). "[T]he test for sufficiency of support in a *parent* application is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the *later* claimed subject matter.' " *Id.* at 1575.

3. *Kennecott Corp. v. Kyocera Int'l., Inc.*, 835 F.2d 1419 (Fed.Cir.1987). "The incorporation of the requirements of section 112 into section 120 ensures that the inventor had possession of the *later*-claimed invention on the filing date of the *earlier* application." *Id.* at 1421.

4. *Utter v. Hiraga*, 845 F.2d 993 (Fed.Cir.1988). "Hiraga's Japanese specification complies with the written description requirement of Section 112 if 'the disclosure of the application as originally filed reasonably conveys to the artisan that [Hiraga] had possession at that time of the *later* claimed [068 interference count] subject matter.' " *Id.* at 999.

5. *Bigham v. Godtfredsen*, 857 F.2d 1415 (Fed.Cir.1988). "This requirement applies to *priority* claims under 35 U.S.C. § 119.... The test is whether the disclosure of 'halogen,' exemplified by chloro, meets the requirements of § 112 as a written***986** description of the bromo and iodo species in the context of the specific invention at issue." *Id.* at 1417.

6. *United States Steel Corp. v. Phillips Petroleum Co.*, 865 F.2d 1247 (Fed.Cir.1989). "In the context of section 120, in this case, focusing on the filing date requires that the claim of the 851 patent be treated as though it were filed in 1953. Only if that claim would at that time have been correctly rejected for lack of support in the 1953 specification may the patentee be denied use of section 120 to *predate* the intervening reference to the 300 patent." *Id.* at 1251.

7. *In re Wright*, 866 F.2d 422 (Fed.Cir.1989). "When the scope of a claim has been changed by amendment in such a way as to justify an assertion that it is directed to a different invention than was the original claim, it is proper to inquire whether the *newly* claimed subject matter was described in the patent application when filed as the invention of the applicant. That is the essence of the so-called 'description requirement' of § 112, first paragraph." *Id.* at 424.

8. *Chester v. Miller*, 906 F.2d 1574 (Fed.Cir.1990). "[T]he EIC simply found that the 280 reference (*parent*) did not support the 122 application claims because as to them it failed to meet the written description requirement." *Id.* at 1577.

9. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555 (Fed.Cir.1991). "The purpose and applicability of the 'written description' requirement ... insure[ ] that subject matter presented in the form of a claim *subsequent* to the filing date of the application was sufficiently disclosed at the time of filing so that the prima facie date of invention can fairly be held to be the filing date of the application." *Id.* at 1562.

10. *In re Hayes Microcomputer Products, Inc.*, 982 F.2d 1527 (Fed.Cir.1992). "The test for sufficiency of support in a *parent* application is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the *later* claimed subject matter.' " *Id.* at 1532.

11. *Fiers v. Revel*, 984 F.2d 1164 (Fed.Cir.1993). "Revel bears the burden of proving entitlement to the benefit of his *earlier*-filed Israeli application date.... Revel must prove that his application meets the requirements of 35 U.S.C. § 112, first paragraph." *Id.* at 1169.

12. *Mendenhall v. Cedarapids*, 5 F.3d 1557 (Fed.Cir.1993). "Mr. Mendenhall himself testified that he did not have any invention directed to introducing virgin aggregate and RAP as specified in the 904 claims until December 1977, and there is no description of that invention in the parent or grandparent applications.... A patentee cannot obtain the benefit of the filing date of an *earlier* application where the claims in issue could not have been made in the *earlier* application." *Id.* at 1565-66.

13. *Eiselstein v. Frank*, 52 F.3d 1035 (Fed.Cir.1995). "In order to determine whether a prior application meets the 'written description' requirement with respect to *later*-filed claims, the prior application .... The test is whether the disclosure of the application relied upon reasonably conveys to a person skilled in

the art that the inventor had possession of the claimed subject matter at the time of the *earlier* filing date." *Id.* at 1038-39.

14. *In re Alton*, 76 F.3d 1168 (Fed.Cir.1996). "The adequate written description requirement ... serves 'to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter *later* claimed by him'." *Id.* at 1172.

*987 15. *Kolmes v. World Fibers Corp.*, 107 F.3d 1534 (Fed.Cir.1997). "The question raised here is whether the claims *added* by the preliminary amendment to the 1992 *continuation* application find adequate support in the 1990 application sufficient to meet the description requirement of section 112, ¶ 1." *Id.* at 1539.

16. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565 (Fed.Cir.1997). "[A] *prior* application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought." *Id.* at 1572.

After LILLY

1. *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473 (Fed.Cir.1998). "Accordingly, his original disclosure serves to limit the permissible breadth of his *later*-drafted claims." *Id.* at 1479.

2. *Tronzo v. Biomet, Inc.*, 156 F.3d 1154 (Fed.Cir.1998). "For a claim in a *later*-filed application to be entitled to the filing date of an *earlier* application under 35 U.S.C. sec. 120, the *earlier* application must comply with the written description requirement of 35 U.S.C. section 112, ¶ 1." *Id.* at 1158.

3. *Union Oil Co., of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989 (Fed.Cir.2000). "However, neither the Patent Act nor the case law of this court requires such detailed disclosure.... Rather the Patent Act and this court's case law require only sufficient description to show one of skill in the refining art that the inventor possessed the claimed invention at the time of filing." *Id.* at 997.

4. *Reiffin v. Microsoft Corp.*, 214 F.3d 1342 (Fed.Cir.2000). "In accordance with § 120, claims to subject matter in a *later*-filed application not supported by an ancestor application in terms of § 112 ¶ 1 are not invalidated; they simply do not receive the benefit of the *earlier* application's filing date." *Id.* at 1346.

5. *Lampi Corp. v. American Power Products, Inc.*, 228 F.3d 1365 (Fed.Cir.2000). "For a claim in a *later*-filed application to be entitled to the filing date of an *earlier* application under 35 U.S.C. 120, the *earlier* application must comply with the requirement of 35 U.S.C. § 112, ¶ 1." *Id.* at 1377. "The requirement is met if 'the disclosure of the application relied upon reasonably conveys to the artisan that the inventor had possession at that time of the *later* claimed subject matter.' " *Id.* at 1378.

6. *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320 (Fed.Cir.2000). "[W]e conclude that the district court did not commit clear error in finding that nothing in the 688 application 'necessarily' ... described the *later* claimed subject matter of the 360 patent." *Id.* at 1327.

7. *TurboCare Div. Of Demag Delaval Turbomachinery Corp. v. General Elec. Co.*, 264 F.3d 1111 (Fed.Cir.2001). "The written description requirement and its corollary, the new matter prohibition of 35 U.S.C. § 132, both serve to ensure that the patent applicant was in full possession of the claimed subject matter on the application filing date. When the applicant adds a claim or otherwise amends his specification after the original filing date, as Brandon did in this case, the new claims or other added material must find support in the original specification." *Id.* at 1118.

LINN, Circuit Judge, with whom RADER and GAJARSA, Circuit Judges, join, dissenting from the court's decision not to the hear the case en banc.

I am in agreement with much of the panel's reasoning in the revised opinion, *988 but part company with the panel's treatment of written description and enablement issues, most notably in the text dealing with the *in ipsis verbis* issue.

With all due respect, the panel opinion in my view conflates and perpetuates the confusion our precedent has engendered between written description as a separate requirement ("possession of the invention")-an issue relevant to priority-and enablement-an issue relevant to the sufficiency of the disclosure. The notion of having to show "possession of the invention" was discussed in *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 19 USPQ2d 1111 (Fed.Cir.1991) and other cases from our court as a convenient way to measure or test entitlement of later filed claims to an earlier priority date. It was not and

should not be a test for sufficiency of disclosure, per se. It should have no place in and does not aid in the disposition of cases where the claims in question are part of the original disclosure. In those cases, entitlement to the filing date is inherent in that the claims themselves-having been filed as part of the original application-provide their own written description.

35 U.S.C. § 112 requires a written description of the invention, but the measure of the sufficiency of that written description in meeting the conditions of patentability in paragraph 1 of that statute, either by reference to a microorganism deposit or in terms *in ipsis verbis* with the language of the claims, should depend solely on whether it enables any person skilled in the art to which the invention pertains to make and use the claimed invention. Where priority is not an issue, as in the present case, the focus once a written description has been found should be on whether the description meets the enablement requirement. Satisfaction of the "possession of the invention" test simply is not relevant.

The question presented by 35 U.S.C. § 112, paragraph 1, is not, "Does the written description disclose what the invention is, or does it merely describe what it does?" The question is, "Does the written description describe the invention recited and described in the claims-themselves part of the specification-in terms that are sufficient to enable one of skill in the art to make and use the claimed invention?" That is the mandate of the statute and is all our precedent, prior to *Regents of the University of California v. Eli Lilly & Co.*, 119 F.3d 1559, 43 USPQ2d 1398 (Fed.Cir.1997) and the present case, demand. For original claims, where priority is not an issue, the notion of possession of the invention is not germane, the claim itself evidencing possession of the invention as of the filing date. In the panel opinion, the discussion of the *in ipsis verbis* issue properly addresses enablement issues but does so in words not of enablement but of "possession of the invention." This conflates the two unrelated issues, elevates "possession" to the posture of a statutory test of patentability-which it is not-and fosters further confusion in what is already a confusing area of our precedent.

The U.S. Patent and Trademark Office ("PTO") aptly states the reason why this case should be taken en banc: "[a]lthough this Court has addressed the 'written description' requirement of section 112 on a number of occasions, its decisions have not taken a clear and uniform position regarding the purpose and meaning of the requirement." PTO amicus brief at 4. This is an area of law that is of significant importance to the biotech industry and affects how patent applications are drafted, prosecuted and will be enforced in this and other areas of emerging technology. When patent attorneys set out to write patent applications, they do so for an educated audience-those skilled in the ***989** art-and attempt to describe the invention in a way that enables those of ordinary skill to make and use the invention as claimed. Before the decision in *Lilly*, the practicing bar had accepted and found workable the notion elucidated in our precedent that § 112 requires a written description sufficient to enable one of ordinary skill in the art to make and use the claimed invention-i.e., enablement. *Lilly* changed the landscape and engendered the debate the panel opinion in this case perpetuates.

Some have praised *Lilly* for maintaining the integrity of patent disclosures and for curbing patent filings for inventions that have not yet been made but are just nascent ideas. Others have been sharply critical of *Lilly*. The debate is well framed by the panel opinion and the contemporaneous dissent of Judge Rader. Those opinions highlight the uncertainty this issue raises in how inventions are protected, in how the PTO discharges its responsibilities, and in how business is conducted in emerging fields of law. These uncertainties will be left unresolved until we clarify this en banc. The issue is important, is ripe for us to consider, and deserves to be clarified, one way or the other. For these reasons, I respectfully dissent from the court's declining to consider this case en banc.

C.A.Fed. (N.Y.),2002.
Enzo Biochem, Inc. v. Gen-Probe Inc.
323 F.3d 956, 63 U.S.P.Q.2d 1609

Briefs and Other Related Documents (Back to top)

- 2002 WL 32345621 (Appellate Brief) Defendants-Appellees' Opposition to Amicus Brief of Government in Support of Petition for Rehearing En Banc (Jul. 10, 2002) Original Image of this Document (PDF)
- 2002 WL 32345618 (Appellate Brief) Brief for the United States as Amicus Curiae in Support of Rehearing En Banc (Jul. 02, 2002) Original Image of this Document (PDF)
- 2002 WL 32345620 (Appellate Brief) Defendants-Appellees' Opposition to Petition For Rehearing En Banc (May. 28, 2002) Original Image of this Document (PDF)
- 2002 WL 32345619 (Appellate Brief) Brief for Fish

& Richardson P.C. as Amicus Curiae in Support of Petitioner for Rehearing En Banc (May. 08, 2002) Original Image of this Document (PDF)
• 2002 WL 32749304 (Appellate Petition, Motion and Filing) Plaintiff-Appellant's Petition for Rehearing En Banc (Apr. 30, 2002) Original Image of this Document with Appendix (PDF)
• 2001 WL 34373100 (Appellate Brief) Reply Brief for Plaintiff-Appellant (Jul. 23, 2001) Original Image of this Document (PDF)
• 2001 WL 34373101 (Appellate Brief) Brief for Defendants-Appellees (Jun. 27, 2001) Original Image of this Document (PDF)
• 2001 WL 34373102 (Appellate Brief) Opening Brief for Plaintiff-Appellant (May. 07, 2001) Original Image of this Document with Appendix (PDF)

END OF DOCUMENT

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte STEPHEN H. HERRMANN,
ZHIJIAN LU,
JOHN M. McCOY,
STEPHEN L. SWANBERG,
BRUCE WALKER, and
OTTO YANG

Appeal No. 2002-1630
Application No. 09/175,713

ON BRIEF

Before WINTERS, ADAMS, and GRIMES, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-14, 17, and 18, all of the claims remaining. Claims 5 and 6 are representative and reads as follows:

5. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine comprises at least one methionine at least one aminooxypentane residue or at least one GroHEK peptide covalently attached to the amino terminus of the chemokine, and wherein the amino-terminal-modified chemokine is derived from a chemokine selected from the group consisting of SDF-IÉ, SDF-1é, IP-10, Mig, GROÉ, GROé, GROÊ, interleukin-8, PF4, ENA-78, GCP-2, PBP, CTAP-III, é-thromboglobulin, NAP-2, C10, DC-CKI, CKÉI, CKÉ2, MCP-1, MCP-2, MCP-3, MCP-4, MIP-IÉ, MIP-1é, lymphotactin, ATAC, eotaxin, eotaxin-2, I-309, HCC-1, HCC-2, HCC3, LARC/MIP-3É, MIP-3é, PARC, TARC, 6Ckine, ELC, SLC, CKé4, CKé6, CKé7, CKé8, CKé9, CKé11, CKé12, CKé13, and CX3C.

6. The composition of claim 1 wherein the polynucleotide is selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO: 6;

(b) a polynucleotide comprising the nucleotide sequence of the protein-coding sequence of the polynucleotide encoding met-hDSF-1É deposited under accession number ATCC 98506;

(c) a polynucleotide encoding an amino-terminal-modified chemokine comprising the amino acid sequence of SEQ ID NO: 10;

(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the amino acid sequence of SEQ ID NO: 10;

(e) a polynucleotide comprising a nucleotide sequence complementary to any one of the polynucleotides specified in (a)-(d) above; and

(f) a polynucleotide capable of hybridizing at either (i) 4xSSC at 65° C or (ii) 50% formamide and 4XSSC at 42°C, to any one of the polynucleotides specified in (a)-(e) above.

The examiner relies on the following reference:

Proudfoot et al. (Proudfoot), "Extension of Recombinant Human RANTES by the Retention of the Initiating Methionine Produces a Potent Antagonist," J. Bio. Chem., Vol. 271 No. 5, pp.2599-2603 (1996)

Claims 1-14, 17, and 18 stand rejected under 35 U.S.C. § 112, first paragraph, as nonenabled.

Claims 1-14, 17, and 18 stand rejected under 35 U.S.C. § 112, first paragraph, as lacking an adequate written description.

We reverse the written description rejection with respect to all the claims. We also reverse the nonenablement rejection with respect to claims 6-9 but affirm it with respect to claims 1-5, 10-14, 17, and 18.

Background

"Chemokines (or chemotactic cytokines) are a class of cytokine molecules capable of chemotactically attracting migratory cells, and are involved in cell recruitment and activation in inflammation." Specification, page 1. "Most chemokines can be divided into two subgroups, CXC (alpha chemokines) or CC (beta chemokines)," and can also be further grouped into families, based on their amino acid sequence. Id., page 2.

The specification discloses that chemokines that have been modified at their amino terminus can interact with chemokine receptors and can have properties different from those of the unmodified chemokine. See, e.g., pages 16-17. Among the specific amino-terminal modifications disclosed in the specification are:

- addition of a methionine residue (page 18, lines 22-24)
- addition of an aminooxypentane residue (page 18, line 24, to page 19, line 4); and
- addition of a "GroHEK" peptide (page 19, lines 9-15).[1]

[1] The GroHEK peptide is a 21-amino acid peptide, shown in SEQ ID NO:5. Specification, page 19, line 10.

The specification provides working examples showing construction of polynucleotides encoding human stromal cell-derived factor 1α (hSDF-1α) and stromal cell-derived factor 1β (hSDF-1β), having either a methionine or a GroHEK peptide attached to the amino terminus. See pages 42-45. The specification discloses that met-hSDF-1β stimulates higher calcium flux in cells than does unmodified hSDF-1β (pages 45-46) and that met-hSDF-1β and unmodified hSDF-1β are equally effective in blocking binding of other compounds to the chemokine receptor (pages 47-48). Finally, the specification discloses that met-hSDF-1β down-modulates expression of the chemokine receptor more effectively than unmodified hSDF-1β, and that this property results in an "enhanced ability of met-hSDF-1β to inhibit HIV infection," since the chemokine receptor is a co-receptor for HIV binding. See pages 48-52.

Discussion

1. Claim construction

Claims 1-5, 10-14, 17, and 18 stand or fall together, as do claims 6-9. Appeal Brief, page 4. We will consider claims 5 and 6 as representative.

Claim 5 is directed to a composition comprising a polynucleotide encoding an amino-terminal modified chemokine. The modified chemokine "comprises at least one methionine, at least one aminooxypentane residue, or at least one GroHEK peptide covalently attached to the amino terminus of the chemokine," and is "derived from" one of forty-nine enumerated chemokines. The specification states that

> [a]n amino-terminal-modified chemokine is "derived from a chemokine" when the chemokine that has been modified at its amino terminus has itself been derived from a chemokine by any kind of alteration, addition, insertion, deletion, mutation, substitution, replacement, or other modification.

Page 17.

Thus, claim 5 encompasses an amino-terminal-modified chemokine "[that] has itself been derived from a chemokine by any kind of alteration, addition, insertion, deletion, mutation, substitution, replacement, or other modification." Therefore, we agree with the examiner's interpretation of claim 5: the claim encompasses "not only specified chemokines but also species comprising additions, insertions, deletions, mutations, substitutions, and replacements, as well as amino-terminal additions of varying lengths and compositions. . . . [Claim 5] encompass[es] all possible alterations to the known chemokine sequences." Examiner's Answer, page 4.

Claim 6, however, is not as broad. Claim 6 is limited to polynucleotides comprising SEQ ID NO:6 or a related polynucleotide (that is, polynucleotides encoding the same amino acid sequence, encoding an amino-terminal fragment thereof, complementary polynucleotides, or polynucleotides that hybridize under stringent conditions). Thus, claim 6 is limited to polynucleotides having a significant amount of structural similarity to a specified nucleotide sequence.

2. Written description

The examiner rejected the claims as not adequately described in the specification. According to the examiner, the claims encompass a very broad "genus" of chemokines, including the forty-nine enumerated proteins modified in

one of three specified ways, but also including "species comprising additions, insertions, deletions, mutations, substitutions, and replacements, as well as amino-terminal additions." Examiner's Answer, page 4. The examiner characterizes the number of chemokines encompassed by the claims as "potentially infinite." Id.

In contrast, according to the examiner, the specification discloses the structure of only four species within the genus, and discloses the functional characteristics of only one. The examiner concluded that "[t]he disclosure of four closely related molecules, each a modified form of SDF-1 alpha or beta, and the functional characteristics of only one, are insufficient to describe the genus." Id.

Appellants argue that

> [t]he chemokines [recited in the claims] . . . were well known in the art by their common laboratory names long before the filing date of the instant application. . . . Therefore, coupled with information known in the art, Appellants have described a procedure of generating chemokine compositions modified at the amino-terminus and those of ordinary skill in the art would readily recognize that Appellants were in possession of the invention as claimed, i.e., a specifically enumerated list of chemokines having known sequences that are modified with GroHEK, methionine, or aminooxypentane at the amino-terminus.

Appeal Brief, pages 9-10.

The examiner "'bears the initial burden . . . of presenting a prima facie case of unpatentability.' . . . Insofar as the written description requirement is concerned, that burden is discharged by 'presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims.'" In re Alton, 76 F.3d 1168, 1175, 37

USPQ2d 1578, 1583 (Fed. Cir. 1996). "[T]he written description requirement can be met by 'show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics . . . i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics.'" Enzo Biochem, Inc. v. Gen-Probe Inc., 296 F.3d 1316, 1324, 63 USPQ2d 1609, 1613 (Fed. Cir. 2002) (emphasis omitted, bracketed material in original).

The Enzo court cited with approval the USPTO's Written Description Examination Guidelines See id. at 1327, 63 USPQ2d at 1615. Particularly relevant here, the court noted that the Written Description Guidelines include an example of "genus claims to nucleic acids based on their hybridization properties." Id. According to the Guidelines, "such claims may be adequately described if they hybridize under highly stringent conditions to known sequences because such conditions dictate that all species within the genus will be structurally similar." Id. The court directed the district court to consider the Guidelines in determining whether the claims at issue were adequately described. See id.

In this case, claims 6-9 are very similar to the genus claims defined by hybridization properties addressed in Enzo, in that the broadest category of nucleic acids defined by these claims are those that hybridize under stringent conditions to a structurally defined polynucleotide. To be consistent with Enzo, therefore, we consider how claims 6-9 would be treated under the Guidelines.

The Enzo court directed the district court to consider specifically Example 9 of the Written Description Guidelines.[2] See 296 F.3d at 1327, 63 USPQ2d at 1615. That example describes a hypothetical application that discloses a single cDNA (SEQ ID NO:1) encoding a receptor-binding protein and claims nucleic acids that hybridize under "highly stringent conditions" to the complement of SEQ ID NO:1. On these facts, the Example concludes that the claimed genus of nucleic acids is adequately described, because "a person of skill in the art would not expect substantial variation among species encompassed within the scope of the claims because the highly stringent hybridization conditions set forth in the eclaim yield structurally similar DNAs."

In our view, claims 6-9 would also be considered to have an adequate written description under the Guidelines. Claims 6-9 differ, in relevant part, from Example 9 of the Guidelines in that the hybridization conditions recited are only stringent rather than highly stringent. That is, the claims recite hybridization conditions of, e.g., 4xSSC and 65°C, while the Example recites conditions of 6xSSC and 65°C. Therefore, claims 6-9 allow the claimed polynucleotides to differ somewhat more in structure from the recited sequence. However, those skilled in the art would expect polynucleotides that hybridize under either stringent or highly stringent conditions to be similar in sequence (i.e., structure) to the target polynucleotide. In any event, the examiner has not adequately

[2] Example 9 of the Written Description Training Materials is available online at the USPTO web site (www.uspto.gov/web/offices/pac/writtendesc.pdf). See pages 35-37.

explained why the polynucleotides of claims 6-9 are not adequately described in the specification.

Claims 1-5, 10-14, 17, and 18 present a closer question. As noted above, these claims are not limited to polynucleotides that encode chemokines that have been modified at their amino terminus; claim 5, for example, also encompasses an amino-terminal-modified chemokine that "has itself been derived from a chemokine by any kind of alteration, addition, insertion, deletion, mutation, substitution, replacement, or other modification." Thus, we do not agree with Appellants' position (Appeal Brief, page 10) that the claims are limited to chemokines having known sequences, modified at amino-terminus.

We do, however, agree with Appellants that the examiner has not shown claims 1-5, 10-14, 17, and 18 to be inadequately described. Again, Enzo provides the applicable standard. The Enzo court held that an adequate description could be provided by disclosing, for example, "complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics." 296 F.3d at 1324, 63 USPQ2d at 1613.

Here, the claims encompass both known chemokines and chemokines that are "derived from" the known chemokines, modified at the amino terminus. This claim scope, however, does not render the specification's description inadequate. The claim limitation requiring that the claimed DNA encode a "chemokine" requires that the encoded protein have chemotactic activity. See

the specification, page 17. Thus, even if the modified chemokine is derived from another chemokine, the modified chemokine must still possess the activity of the wild-type protein. As the examiner herself pointed out, changes in amino acid sequence have unpredictable effects on protein function. See the Examiner's Answer, page 6. Thus, those skilled in the art would reasonably expect that chemokines that are "derived from" known chemokines would usually have to share a high degree of sequence similarity to the wild-type chemokine in order to also share its chemotactic activity.

The Enzo court held that a compound can be described by "complete or partial structure, other physical and/or chemical properties, [or] functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics." 296 F.3d at 1324, 63 USPQ2d at 1613. The examiner has not adequately explained why the instant specification does not provide such a description of the claimed chemokine-encoding polynucleotides.

For the above reasons, we reverse the examiner's rejection of claims 1-14, 17, and 18, for inadequate written description.

3. Enablement

The examiner also rejected all of the claims as non-enabled, although she acknowledged that the specification was enabling for the exemplified species met-SDF-1β. Examiner's Answer, page 6. The examiner also conceded that "generation of modified proteins is standard in the art," id., so that "one of skill in

the art would be able [sic, would have been able] to make the claimed molecules." Id., page 7.

The examiner nonetheless concluded that the claims were not enabled throughout their full scope, based on several factors. First, the examiner found that the claims are extremely broad, in that they encompass modified chemokines that have no structural relationship to each other, as well as "a potentially infinite number of variants of these modified chemokines." See the Examiner's Answer, page 6. The examiner also found that the specification provides only one working example of a modified chemokine having enhanced function relative to the unmodified chemokine, and the specification does not provide guidance to allow those of skill in the art to predictably identify and use other functional, amino-modified chemokines. Id., pages 6 and 7. Finally, the examiner found that the effect of additions or variations, within the naturally occurring amino acid sequence of a chemokine, have unpredictable effects on the function of the chemokine. Id., page 6.

The examiner therefore concluded that practicing the claimed invention throughout its full scope would have required undue experimentation. Id., page 7.

Appellants argue that the examiner has conceded that the specification would have enabled those skilled in the art to make the claimed products. Appeal Brief, page 12. With respect to the "how to use" prong of enablement, Appellants argue that

> [t]he test of enablement is whether one reasonably skilled in the art could make and use the invention from the disclosures in the application coupled with information known in the art without undue experimentation. The enablement requirement does not require that the disclosure provide any type of prediction with respect to the end results obtained from practicing the invention, which is what Examiner indicates is missing from the disclosure. In the instant case, Appellants have provided a detailed road map to enable one of ordinary skill in the art to practice the invention without undue experimentation. Appellants therefore submit that the "use" aspect of the claimed invention has also been met.

Appeal Brief, pages 12-13.

With respect to claims 6-9, Appellants argue that "[t]he narrow subset of modified chemokines in claims 6-9 are defined by SEQ ID NOs and ATCC accession numbers that are disclosed in the specification and therefore enable one of ordinary skill in the art to practice the invention claimed." Appeal Brief, page 13.

The examiner bears the initial burden of showing that a claimed invention is not enabled. See In re Wright, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). "Although the statute does not say so, enablement requires that the specification teach those in the art to make and use the invention without 'undue experimentation.' . . . That some experimentation may be required is not fatal; the issue is whether the amount of experimentation required is 'undue.'" In re Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991) (emphasis in original).

"Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed.

Cir. 1988). Those considerations include the quantity of experimentation needed, the amount of guidance provided, the presence of working examples, the nature of the invention, the state of the prior art, the skill of those in the art, the degree of unpredictability involved, and the breadth of the claims. See id.

In this case, we agree with the examiner that the broadest of the claims on appeal (claims 1-5, 10-14, 17, and 18) are not enabled throughout their full scope. However, we conclude that the examiner's reasoning does not suffice to show nonenablement of the group of narrower claims (claims 6-9) that Appellants separately argue.

a. Claims 1-5, 10-14, 17, and 18

Claims 1-5, 10-14, 17, and 18 stand or fall together. Appeal Brief, page 4. We will consider claim 5 as representative. As discussed above (pages 3-4), claim 5 encompasses chemokines modified at the amino terminus, where the chemokine can be one of forty-nine naturally occurring chemokines, or it can be a chemokine "derived from" any of the forty-nine enumerated chemokines "by any kind of alteration, addition, insertion, deletion, mutation, substitution, replacement, or other modification." Specification, page 17. We agree with the examiner that undue experimentation would have been required to practice the full scope of claim 5.

Most of the Wands factors favor a conclusion of nonenablement. The scope of claim 5 is enormous: the claim encompasses not just the forty-nine enumerated chemokines, modified in one of three ways at the amino terminus, but also encompasses an amino-terminal modified chemokine that can be

derived from any of the enumerated chemokines by any kind of alteration. Thus, the claim encompasses any conceivable mutant or variant of any of the recited forty-nine chemokines, modified at the amino terminus, provided the modified chemokine displays chemotactic activity (i.e., it is still a chemokine).

The evidence of record also supports the examiner's position that the effect of changing a chemokine's amino acid sequence is unpredictable. The examiner cited Proudfoot as evidence that the addition of a methionine residue at the amino terminus has opposite effects on different chemokines. That is, the specification shows that the addition of an amino-terminal methionine increases the activity of the chemokine SDF-1β, while Proudfoot shows that the same modification to the chemokine RANTES produces an inactive antagonist. See the Examiner's Answer, pages 12-13.

In addition, as the examiner noted, the working examples are limited to SDF-1α and SDF-1β, modified at the amino terminus with either a methionine or a GroHEK peptide. See the specification, pages 42-52. No working examples are provided showing the effect of aminooxypentane modification, nor are examples provided for any of the forty-seven other chemokines recited in claim 5, nor are examples provided showing the effect of modifying the sequence of a naturally occurring chemokine. The specification provides no guidance regarding which direction experimentation should proceed in making and using amino-terminal-modified chemokines differing from the naturally occurring chemokine "by any kind of alteration, addition, insertion, deletion, mutation, substitution, replacement, or other modification."

While the examiner has conceded that those of skill in the art could have made the chemokine variants encompassed by the claims, in view of the breadth of claim 5, a great deal of experimentation would have been involved in determining which of the variants were active and which were not. While Appellants are correct in arguing that there is no per se rule requiring predictability in extrapolating beyond the exemplified embodiments, predictability or the lack thereof is one of the factors to be considered in the Wands analysis. See Atlas Powder Co. v. E.I. Du Pont De Nemours & Co., 750 F.2d 1569, 1576, 224 USPQ 409, 414 (Fed. Cir. 1984): "Even if some of the claimed combinations were inoperative, the claims are not necessarily invalid. . . . Of course, if the number of inoperative combinations becomes significant, and in effect forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention, the claims might indeed be invalid."

In view of the sweeping breadth of claim 5, and the absence of any basis for predicting which chemokine variants will retain activity, a great deal of experimentation would have been required to distinguish between operative and inoperative embodiments. We agree with the examiner that the amount of experimentation required to practice the full scope of claim 5 would have been undue. We therefore affirm the rejection of claims 1-5, 10-14, 17, and 18 for nonenablement.

b. Claims 6-9

The examiner included claims 6-9 in the rejection for nonenablement. The examiner explained that these claims were included in the rejection because they

"encompass sequences comprising fragments as well as sequences identified by homology. They thus encompass sequences that vary widely from what is disclosed, and the skilled artisan would not predictably be able to use such molecules as disclosed." Examiner's Answer, page 15.

We reverse the rejection as it is applied to claims 6-9. These claims are of much narrower scope than, for example, claim 5. Claim 6 is representative. It encompasses the specific polynucleotide sequence of SEQ ID NO:6 (also defined by reference to an ATCC accession number), polynucleotides encoding the same amino acid, and the complements of these polynucleotides. These parts of the claim do not seem to bother the examiner.

The examiner's basis for rejecting the claim as nonenabled are the two other types of polynucleotide encompassed by claim 6: "(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the amino acid sequence of SEQ ID NO:10; . . . [and] (f) a polynucleotide capable of hybridizing at either (i) 4xSSC at 65°C or (ii) 50% formamide and 4xSSC at 42°C, to any of the polynucleotides specified in (a)-(e) above." The examiner has not adequately explained why practicing these parts of claim 6 would have required undue experimentation.

With respect to fragments, the examiner has presented no explanation of why undue experimentation would have been required to distinguish between active and inactive amino-terminal fragments of a specified polypeptide sequence. With respect to "hybridizing" polynucleotides, such as those recited in part (f) of claim 6, the specification defines the recited conditions as being

"stringent hybridization conditions." See page 22. Thus, the polynucleotides encompassed by claims 6-9 do not include the "potentially infinite number of variants," Examiner's Answer, page 6, that are encompassed by claim 5 and that result in a requirement of undue experimentation.

We agree with Appellants that the set of modified cytokines encompassed by claims 6-9 is narrower than those encompassed by claim 5. The examiner has not adequately explained why undue experimentation would have been required to practice the smaller genus of chemokines recited in claims 6-9. We therefore reverse the rejection of claims 6-9.

Other Issues

1. Claims 17 and 18

Claims 17 and 18 read as follows:

17. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the chemokine binds the fusin/CXCR4 chemokine receptor

18. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine is a more effective inhibitor of HIV infection than the corresponding unmodified chemokine.

Thus, claims 17 and 18 are directed to genera of polynucleotides, defined by function rather than structure. The Federal Circuit has held that "A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the

genus." University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). See also Enzo, 296 F.3d at 1324, 63 USPQ2d at 1613: a compound can be described by "complete or partial structure, other physical and/or chemical properties, [or] functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics."

Although we reversed the examiner's written description rejection (which included claims 17 and 18), our decision was based only on the examiner's rationale for rejecting the claims, which did not separately address claims 17 and 18. If claims 17 and 18 are subject to further examination, the examiner should consider whether the specification's description of the claimed genera meet the standards set out in Lilly and Enzo.

2. Claim 1

Claim 1 is directed to a polynucleotide encoding a modified chemokine, where the chemokine can be modified by addition of an aminooxypentane residue. However, the specification discloses that an aminooxypentane residue is added to the N-terminus of protein by a series of chemical reactions: first, a serine or threonine residue is converted to an aldehyde; then the aldehyde is reacted with aminooxypentane to form the desired aminooxypentane-modified chemokine. Since the aminooxypentane residue is added post-translationally, it is unclear how an aminooxypentane-modified chemokine can be encoded by a polynucleotide. It would appear that the polynucleotide encoding an

aminooxypentane-modified chemokine would be the same as the polynucleotide encoding the unmodified chemokine.

On return of this application, the examiner should consider whether claim 1 is sufficiently definite to meet the requirements of 35 U.S.C. § 112, second paragraph. In addition, if a polynucleotide encoding an aminooxypentane-modified chemokine is, in fact, the same as a polynucleotide encoding an unmodified chemokine, the examiner should consider whether any of the claims are anticipated by prior art disclosing a chemokine-encoding polynucleotide.

Summary

We reverse the rejection for inadequate written description because the examiner has not adequately explained why those skilled in the art would not have recognized the specification's description as showing that Appellants were in possession of the invention now claimed. We also reverse the rejection of claims 6-9 for nonenablement, because the examiner has not explained why undue experimentation would have been required to make and use fragments of the recited amino-terminal-modified chemokines, or variants encoded by polynucleotides that hybridize under stringent conditions. However, we affirm the rejection of claims 1-5, 10-14, 17, and 18 for nonenablement, because claim 5 reads on amino-terminal-modified chemokines that vary from the recited chemokines in any way and to any degree, and the specification does not provide sufficient guidance to practice the very broad scope of this claim. Claims 1-4, 10-14, 17, and 18 fall with claim 5.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED IN PART

Sherman D. Winters Administrative Patent Judge	))))) BOARD OF PATENT
Donald E. Adams Administrative Patent Judge	)) APPEALS AND)) INTERFERENCES
Eric Grimes Administrative Patent Judge	))

Margaret A. Boulware
Henkens & Gilchrist
1100 Louisiana Street
Suite 1800
Houston, TX 77002-5214

EG/jlb

Paper No. 36

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte OLGA BANDMAN, JENNIFER L. HILLMAN,
PREETI LAL, KARL J. GUEGLER,
GINA GORGONE, NEIL C. CORLEY,
CHANDRA PATTERSON, and
MARIAH R. BAUGHN

Appeal No. 2003-1805
Application No. 09/079,892

ON BRIEF

Before WINTERS, WILLIAM F. SMITH, and GRIMES, Administrative Patent Judges.

WILLIAM F. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 25 through 28 and 33 through 37. Claims 6 through 12 are pending and have been allowed. Claims 29 through 32 are also pending but have been withdrawn from consideration by the examiner. Claims 25 and 33 are representative of the subject matter on appeal. Since claim 25 refers to allowed claim 7, we reproduce claims 7, 25, and 33 as follows:

7. An isolated and purified polynucleotide comprising a polynucleotide sequence as shown in SEQ ID NO:4, wherein said polynucleotide of SEQ ID NO:4 encodes a polypeptide having glutamine fructose-6-phosphate amidotransferase activity.

25. A method for detecting a target polynucleotide in a sample, wherein said target polynucleotide comprises the polynucleotide of claim 7, the method comprising:

a) hybridizing the sample with a probe comprising at least 20 contiguous nucleotides comprising a sequence complementary to said target polynucleotide in the sample, and which probe specifically hybridizes to said target polynucleotide, under conditions whereby a hybridization complex is formed between said probe and said target polynucleotide or fragments thereof, and

b) detecting the presence or absence of said hybridization complex, and, optionally, if present, the amount thereof.

33. An isolated polynucleotide selected from the group consisting of:

a) a polynucleotide comprising the polynucleotide sequence of SEQ ID NO:4,

b) a polynucleotide comprising a naturally occurring polynucleotide sequence at least 90% identical to the polynucleotide sequence of SEQ ID NO:4,

c) a polynucleotide complementary to a polynucleotide of a),

d) a polynucleotide complementary to a polynucleotide of b), and

e) an RNA equivalent of a)-d).

The examiner relies upon the following references:

Nishi et al. (Nishi '713)	5,876,713	Mar. 2, 1999
Eur. Pat. App. (Nishi EPA)	EP 824,149 A2	Feb. 18, 1998

Claims 33 through 37 stand rejected under 35 U.S.C. § 112, first paragraph (written description). Claims 25 through 28 and 37 stand rejected under 35 U.S.C. § 103(a). As evidence of obviousness, the examiner relies upon Nishi '713 and Nishi EPA in the alternative. We reverse the written description rejection and affirm the obviousness rejection.

Background

The present invention involves human carbohydrate metabolism enzymes referred to by appellants as "CARM." Specification, page 5. As seen from claims 7, 25, and 33 reproduced above, the claims under review in this appeal involve the polynucleotide sequence as shown in SEQ ID NO:4 which is said to code for CARM-1. Id., page 19, lines 14 through 20. As explained:

> CARM-1 has chemical and structural similarity with human glutamine: fructose-6-phosphate amidotransferase (GI 183082). In particular, CARM-1 and human glutamine: fructose-6-phosphate amidotransferase share 78% identity. A fragment of SEQ ID NO:4 from about nucleotide 243 to about nucleotide 260 is useful, for example, as a hybridization probe. Northern analysis shows the expression of this sequence in various libraries, at least 51% of which are immortalized or cancerous and at least 46% of which involve immune response. Of particular note is the expression of CARM-1 in gastrointestinal, male and female reproductive, and nervous tissues.

Id., page 20, lines 4 through 11.

Discussion

1. Written description.

The examiner considers that claims 33 through 37 do not comply with the written description requirement of 35 U.S.C. § 112, first paragraph, since:

> The specification defines an 'allelic sequence' (see page 10) as an alternative form of the gene which may result from at least one mutation in the nucleic acid sequence and may result in altered mRNAs or in polypeptides whose structure or function may or may not be altered and that any given natural or recombinant gene may have none, one or many, allelic forms, and that common mutational changes which give rise to allelic variants are generally ascribed to natural deletions, additions, substitutions of nucleotides each of which may occur alone or in combination with the others one or more times in a given sequence. This definition does not provide any specific information about the structure of naturally occurring (alleles) variants of SEQ ID NO:4 (i.e. where are the regions within which mutations are likely to occur) nor discloses any function for naturally occurring variants. There is no description of the mutational sites that exist in nature, and there is no description of how the structure of SEQ ID NO:4 relates to the structure of any naturally

> occurring alleles. The general knowledge in the art concerning alleles does not provide any indication of how one allele is representative of unknown alleles. The nature of alleles is such that they are variant structures, and in the present state of the art structure of one does not provide guidance to the structure of others. Therefore, many functionally unrelated DNAs are encompassed within the scope of these claims. The specification discloses only a single species of the claimed genus (i.e. the sequence encoding SEQ ID NO:2) which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Examiner's Answer, paragraph bridging pages 3 and 4.

The examiner also

> [F]ully acknowledges appellants' recitation of the structural limitations of the polynucleotides of claim 33 parts b) and d)-e). However, the polynucleotides as defined in claim 33 parts b) and d)-e) encompass a genus of polynucleotides that encompasses widely variant species, some having the same functions as the polypeptide of SEQ ID NO:1, some having unknown and distinctly different functions and some possibly having no function. While one of skill in the art, provided the polynucleotide sequence of SEQ ID NO:4, may be able to recognize variants of SEQ ID NO:4 with nucleotide sequence sharing 90% identity, one cannot recognize which of these variants occurs naturally and is thus encompassed by the genus of claim 33 part b). Therefore, the skilled artisan would not be able to recognize a member of the claimed genus of polynucleotides merely from its structural definition. This enormous genus will encompass a wide variety of polynucleotides with their own distinct properties. Because appellants have provided no functional limitation for the claimed polynucleotides, the single disclosed polynucleotide of SEQ NO:4 is not representative of the entire genus and one of skill in the art would not recognize that appellants were in possession of all polynucleotides comprising a naturally-occurring polynucleotide having at least 90% identity to SEQ ID NO:4 as encompassed by the claims.

Examiner's Answer, paragraph bridging pages 11 and 12.

The Federal Circuit discussed the application of the written description requirement to inventions in the field of biotechnology in University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997), stating

that "[a] written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials" Id. at 1567, 43 USPQ2d at 1405. The court also stated that

> a generic statement such as 'vertebrate insulin cDNA' or 'mammalian insulin cDNA,' without more, is not an adequate written description of the genus because it does not distinguish the genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, as we have previously indicated, does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is.

Id. at 1568, 43 USPQ2d at 1406. The court concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id.

Finally, the court addressed the manner by which a genus of cDNAs might be described. "A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the genus." Id.

In reviewing this rejection, we note that the examiner has not rejected claim 8 under this section of the statute. Claim 8 reads:

8. An isolated and purified polynucleotide comprising a naturally occurring polynucleotide sequence having at least 90% sequence identity to the polynucleotide of SEQ ID NO:4, wherein said naturally occurring polynucleotide sequence encodes a polypeptide having glutamine-fructose-6-phosphate amidotransferase activity.

As seen, claim 8 differs from claim 33 b) which is the focus of the examiner's written description rejection in that it adds the limitation that the naturally occurring polynucleotide sequence encodes a polypeptide having glutamine-fructose-6-phosphate amidotransferase activity. Since the examiner has conceded that a claim having the scope of claim 8 complies with the written description requirement of 35 U.S.C. § 112, we do not find that the lack of a statement of function in claim 33 b) means that that portion of the claim lacks written descriptive support.

Claim 33 b) defines a genus of polynucleotides by way of two significant qualifiers. First, the polynucleotide of claim 33 b) must be "naturally occurring." Second, the polynucleotide of claim 33 b) must be "at least 90% identical to the polynucleotide sequence of SEQ ID NO:4." As explained in Lilly, a genus of polynucleotides can be described by a representative number of polynucleotides sharing common structural features which constitute a substantial portion of the genus. The examiner is correct in his analysis that claim 33 b) includes so-called nonfunctional alleles. However, those nonfunctional alleles must be "naturally occurring" and be at least "90% identical to the polynucleotide sequence of SEQ ID NO:4." In our view, these two limitations adequately describe the genus of polynucleotides encompassed by claim 33 b) without that claim further including a functional limitation.

We understand the examiner's concern that one may not recognize that a polynucleotide sequence having 90% identity with that of SEQ ID NO: 4 is "naturally occurring." However, that concern is more properly raised under a rejection under 35 U.S.C. § 112, second paragraph, rather than the written description requirement of the first paragraph.

The written description rejection is reversed.

2. Obviousness.

We initially note that appellants state that the claims are grouped together for the purposes of this rejection. Appeal Brief, page 5. Accordingly, we shall decide the issues raised in the Examiner's obviousness rejection as they pertain to claim 25. 37 CFR § 1.192(c)(7). We also note that the two Nishi references relied upon by the examiner appear to be the same. Thus, we shall consider the merits of the examiner's rejection as it is based upon Nishi '713.

Claim 25 is directed to a method for detecting a target polynucleotide said to comprise the polynucleotide of claim 7 in a sample. To this end, a sample is hybridized with a probe comprising at least 20 contiguous nucleotides comprising a sequence complementary to said target polynucleotide in the sample. The probe will specifically hybridize to the target polynucleotide, if present, forming a hybridization complex. The presence or absence of the hybridization complex is an indication as to whether the sample contained the target polynucleotide.

The examiner has determined without dispute by appellants that Nishi '713 describes a polynucleotide encoding a carbohydrate metabolizing enzyme (glutamine:fructose-6-phosphate amidotransferase activity) that is 100% identical to the amino acid sequence set forth in SEQ ID NO:1 of this application. Examiner's Answer, page 6. The examiner has also determined, again without dispute by appellants, that Nishi '713 describes a polynucleotide sequence encoding that polypeptide that is 67.7% identical to the polynucleotide sequence set forth in SEQ ID NO:4 of this application. Id. The basis for the examiner's findings are the sequence comparison printouts

obtained as a result of an electronic search of sequence databases. As seen from the sequence search report dated December 14, 1999, U.S.-09-079-892-4.rng, pages 1-3 the polynucleotide sequence extending from nucleotide 99-2144 of SEQ ID NO:4 of this application is 100% identical to the coding sequence set forth in Nishi '713. See, e.g., Figs. 2A-2F and SEQ ID NO:5 of Nishi '713.

The examiner has concluded that it would have been obvious to a person of ordinary skill in the art to use any 20 contiguous nucleotides in the region of the polynucleotide sequence described in Nishi '713 as a probe in either a hybridization reaction or as part of a set of probes/primers in a PCR reaction to detect a target polynucleotide. Once again, appellants do not dispute this aspect of the examiner's position. Indeed, Nishi suggests as much, stating:

> The DNA encoding the protein or the partial peptide of the present invention can be cloned either by PCR amplification by using synthetic DNA primers having a partial nucleotide sequence of the DNA coding for the protein or by hybridization using the DNA inserted in a suitable vector and labeled DNA fragment or synthetic DNA coding for a part or full region of the protein or the partial peptide of the present invention. The hybridization can be carried out by the method described in Molecular Cloning, 2nd (J. Sambrook et al., Cold Spring Harbor Lab. Press, 1989). When a commercially available DNA library is used, the instructions given in the accompanying manual can be followed.

Nishi '713, column 15, lines 54 through 65.

Where the appellants and the examiner part company in regard to the obviousness rejection has to do with whether claim 25 on appeal is "directed only to detecting the target polynucleotides, comprising the polynucleotides recited in claim [] 7 . . ." (Appeal Brief, page 12) or whether claim 25 is inclusive of "detecting any target polynucleotide which hybridizes to probes generated from the sequence of

Nishi. . .." (Appeal Brief, page 11) (emphasis in each original). Appellants urge that claim 25 must be read such that the claimed method detects only the polynucleotides recited in claim 7. We disagree with appellants' claim construction.

First, appellants' position does not take into account that claim 25 explicitly reads upon a negative result, i.e., the probe comprising at least 20 contiguous nucleotides will not hybridize to any nucleotide sequence in the sample. This is seen in that claim 25 b) includes detecting the absence of a hybridization complex. Since appellants have not contravened the basic premise of the examiner's obviousness rejection, i.e., it would have been obvious to one of ordinary skill in the art to use a probe comprising at least 20 contiguous nucleotides based upon the polynucleotide sequence described in Nishi '713 in a hybridization method, the performance of such a method that results in a negative result reads directly upon claim 25. Thus, the examiner's rejection can be sustained on this basis.

Second, we do not read claim 25 in the manner in which appellants do. In our view, claim 25 is not limited "only to detecting the target polynucleotides comprising the polynucleotides recited in claim [] 7 . . .." Appeal Brief, page 12. Once a probe comprising at least 20 contiguous nucleotides is constructed based upon the polynucleotide sequence described in Nishi '713, the use of that probe in a hybridization method will result in the hybridization complex being formed if the probe hybridizes to any polynucleotide sequence in the sample under the hybridization conditions used. Thus, an appropriately constructed probe based upon the polynucleotide sequence described in Nishi '713 will hybridize to a polynucleotide sequence such as that of Nishi

'713, that of SEQ ID NO:4 of this application or any other polynucleotide sequence having sufficient complementarity given the hybridization conditions used.

The examiner's obviousness rejection is affirmed.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

Sherman D. Winters Administrative Patent Judge	)
William F. Smith Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
Eric Grimes Administrative Patent Judge	)

Incyte Corporation
3160 Porter Drive
Palo Alto, CA 94304

dem

USPTO PATENT FULL-TEXT AND IMAGE DATABASE

Searching 1976 to present...

Results of Search in 1976 to present db for:
ACLM/"stringent conditions": 1198 patents.
Hits 1 through 50 out of 1198

Next 50 Hits

Jump To

Refine Search ACLM/"stringent conditions"

	PAT. NO.	Title
1	6,905,856	Soluble GlcNAc phosphotransferase
2	6,905,855	Isolated human drug-metabolizing proteins, nucleic acid molecules encoding human drug-metabolizing proteins, and uses thereof
3	6,905,822	Methods of diagnosing multidrug resistant tuberculosis
4	6,903,077	Methods and products for delivering nucleic acids
5	6,902,916	Nucleotide sequences coding for the lysR1 gene
6	6,902,907	Cystic fibrosis gene
7	6,902,735	Antibodies to human IL-17F and other CTLA-8-related proteins
8	6,900,045	Human kinase proteins and polynucleotides encoding the same
9	6,897,358	Nucleic acid molecules encoding wheat enzymes involved in starch synthesis
10	6,894,157	Guanylate binding protein (GBP-1) as inhibitor of cell proliferation and molecular marker for the determination of the stage of cellular differentiation
11	6,894,147	Intermediate conductance calcium-activated potassium channels (IK1)
12	6,893,872	Pesticidal toxins
13	6,893,852	Dna encoding sucrose pts enzyme II
14	6,893,826	Cotton event PV-GHBK04 (757) and compositions and methods for detection thereof
15	6,890,746	Gene participating in the production of homo-glutamic acid and utilization thereof
16	6,890,731	Isolated human G-protein coupled receptors that are members of the aminergic subfamily, nucleic acid molecules encoding human GPCR proteins, and uses thereof
17	6,887,989	Sequences from Piscirickettsia salmonis
18	6,887,661	Recombinant bHLH-PAS/JHR polypeptide and its use to screen potential insecticides
19	6,884,775	Methods and compositions for regulating skeletogenic formation
20	6,881,720	Antimicrobial protein from Lyophyllum shimeji
21	6,881,566	Carbamoyl-phosphate synthetase gene of coryneform bacteria and method for

producing L-arginine

22 6,878,533 Gene encoding dihydrodipicolinate synthase from Bacillus methanolicus and methods of making lysine wing said gene

23 6,875,854 Compositions and methods for the improved diagnosis and treatment of germ cell tumors

24 6,875,570 Proteins and nucleic acids encoding same

25 6,872,704 Acidic mammalian proteins and polynucleotides encoding the same

26 6,872,558 Heparanase-2 a member of the heparanase protein family

27 6,872,557 Gene encoding novel human secretory phospholipase A2

28 6,869,791 Method for sterilizing transformed cells

29 6,867,351 Protein kinase stress-related proteins and methods of use in plants

30 6,867,291 Human hemicentin proteins and polynucleotides encoding the same

31 6,867,025 Human hydroxylases and polynucleotides encoding the same

32 6,864,236 Biglycan and related therapeutics and methods of use

33 6,864,066 Epithelial protein lost in neoplasm (EPLIN)

34 6,863,888 Oncoprotein protein kinase

35 6,861,577 Promoter of a maize major latex protein gene and methods of using it to express heterologous nucleic acids in transformed plants

36 6,861,574 Sodium/proton antiporter gene

37 6,861,242 Methods for producing highly phosphorylated lysosomal hydrolases

38 6,861,240 Human kinases and polynucleotides encoding the same

39 6,861,239 Genes and polynucleotides associated with ultraviolet radiation-mediated skin damage and uses thereof

40 6,858,422 Lipase genes

41 6,858,421 Cytosolic phospholipase A2-beta enzymes

42 6,849,431 Non-B, non-C, non-G hepatitis virus gene, polynucleotide, polypeptide, virus particle, method for isolating virus particle, and method for detecting virus

43 RE38,689 Ceramidase gene

44 6,844,148 Alzheimer's disease secretase, APP substrates therefor, and uses therefor

45 6,841,720 Inducible promoters

46 6,841,718 Transgenic plants incorporating traits of Zostera marina

47 6,841,377 Human kinase and polynucleotides encoding the same

48 6,838,267 Nucleotide sequences coding for the ccpA1 gene

49 6,838,262 Isolated DNA molecule encoding rank ligand

50 6,838,261 Nucleic acids encoding anti-CD40 proteins and methods of producing recombinant anti-CD40 proteins

---

USPTO PATENT FULL-TEXT AND IMAGE DATABASE

Home | Quick | Advanced | Pat Num | Help

Next List | Bottom | View Cart

Searching US Patent Collection...

Results of Search in US Patent Collection db for:
(ACLM/(identity OR homology) AND (nucleotide OR polypeptide)): 2923 patents.
*Hits **1** through **50** out of **2923***

Next 50 Hits

Jump To

Refine Search aclm/(identity or homology) and (nucleotide or polype

	PAT. NO.	Title
1	7,064,193	Therapeutic molecules
2	7,064,184	Mag1 antimicrobial polypeptides and their uses
3	7,064,183	Fus6 family antimicrobial polypeptides and their uses
4	7,063,973	HDAC9 polypeptides and polynucleotides and uses thereof
5	7,063,971	Phosphodiesterase enzymes
6	7,063,841	Mammalian cell surface antigens; related reagents
7	7,061,491	Method for solving frequency, frequency distribution and sequence-matching problems using multidimensional attractor tokens
8	7,060,813	Plant RNA-directed RNA polymerase proteins
9	7,060,812	PRO1312 nucleic acids
10	7,060,810	Regulation of human eosinophil serine protease 1-like enzyme
11	7,060,794	Protein that enhances expression of potassium channels on cell surfaces and nucleic acids that encode the same
12	7,060,680	Morphogen treatments for limiting proliferation of epithelial cells
13	7,060,505	Assay device
14	7,060,491	Polynucleotides encoding novel BT toxin receptors from lepidopteran insects
15	7,060,481	Isolated human phospholipase proteins, nucleic acid molecules encoding human phospholipase proteins, and uses thereof
16	7,060,468	Thermostable glucoamylase
17	7,060,432	Methods for the detection, identification, and/or enumeration of yeast, particularly in wine

18 7,060,278 Bv8 nucleic acids and polypeptides with mitogenic activity
19 7,059,993 Thermal tolerant cellulase from Acidothermus cellulolyticus
20 7,058,650 Methods for establishing a pathways database and performing pathway searches
21 7,058,517 Methods for obtaining and using haplotype data
22 7,058,515 Methods for making character strings, polynucleotides and polypeptides having desired characteristics
23 7,057,165 Probe for mass spectrometry
24 7,057,087 Application of aspen MADS-box genes to alter reproduction and development in trees
25 7,057,023 Methods and apparatus for spinning spider silk protein
26 7,057,018 Pro 1474 polypeptides
27 7,056,888 Pesticidal proteins and methods of using these proteins
28 7,056,882 Treatment to prevent loss of and/or increase bone mass in metabolic bone diseases
29 7,056,721 EGVI endoglucanase and nucleic acids encoding the same
30 7,056,718 Polypeptides having oxaloacetate hydrolase activity and nucleic acids encoding same
31 7,056,715 GST sequences from soybean and their use in the production of herbicide resistant plants
32 7,056,714 Carboxylic acid reductase polypeptide, nucleotide sequence encoding same and methods of use
33 7,056,709 Isolation and expression of a gene for a nitrilase from Acidovorax faclilis 72W
34 7,056,691 Assays for identifying .alpha.-galactosidases
35 7,056,659 Characterizing nucleic acids
36 7,053,269 Phospholipid:diacylglycerol acyltransferases
37 7,053,268 Promoter
38 7,053,205 Cassava vein mosaic virus promoter nucleic acid sequences and expression vectors
39 7,053,182 Genes regulating circadian clock functional and photoperiodism
40 7,052,898 Thermostable isomerase and use hereof, in particular for producing tagatose
41 7,052,896 Lactobacillus rhamnosus polynucleotides, polypeptides and methods for using them
42 7,052,895 Phosphodiesterase enzymes
43 7,052,879 Recombinant Candida rugosa lipases
44 7,052,873 Natural human antibody
45 7,052,870 mTOR kinase-associated proteins
46 7,052,857 Expression of functional human olfactory cyclic nucleotide gated (CNG) channel in recombinant host cells and use thereof in cell based assays to identify GPCR modulators
47 7,052,684 Methods of healing wounds and fibrotic disorders using IL-10
48 7,049,418 Therapeutic and diagnostic agents comprising a SOCS box
49 7,049,125 EGVIII endoglucanase and nucleic acids encoding the same
50 7,049,124 Hyaluronidase from the Hirudinaria manillensis isolation, purification and recombinant method of production

---

Next List | Top | View Cart